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Date 4/1/02 Serial # 09/654,501 Priority Application Date 9/2/99

Your Name BILL BAUMEISTER Examiner # 74932

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In what format would you like your results? Paper is the default. (PAPER) DISK EMAIL

If submitting more than one search, please prioritize in order of need.

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Circle: USPT DWPI EPO Abs JPO Abs IBM TDB

Other: EAST

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Primary Refs ✓ Nonpatent Literature ✓ Other ANY
Secondary Refs ✓ Foreign Patents ✓
Teaching Refs ✓

What is the topic, such as the novelty, motivation, utility, or other specific facets defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, registry numbers, definitions, structures, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract and pertinent claims.

See Attachment

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OFF T, W, F

4/1/02 Received

Staff Use Only	Type of Search	Vendors
Searcher: Derrick Blalock	Structure (#)	STN
Searcher Phone: 306-0933	Bibliographic ✓	Dialog
Searcher Location: STIC-EIC2800, CP4-9C18	Litigation	Questel/Orbit
Date Searcher Picked Up: 4/3/02	Fulltext	Lexis-Nexis
Date Completed: 4/3/02	Patent Family	WWW/Internet
Searcher Prep/Rev Time: 1.10	Other	Other
Online Time: 22.0		

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     FILE 'REGISTRY' ENTERED AT 13:33:32 ON 03 APR 2002
L1            1 S ZINC SULFIDE/CN
L2        89286 S ZN/ELF
L3        54217 S ZN/MAC
L4        19464 S S/MAC
L5          476 S EU/MAC
L6           10 S EU S ZN/ELF
L7           37 S ZINC SULFIDE AND (DOPE OR DOPING OR DOPED OR DOPANT OR DOPANT
L8            1 S YTTRIUM OXYSULFIDE/CN
L9        10290 S Y/MAC
L10       12906 S O/MAC
L11       19464 S S/MAC
L12       11889 S CE/MAC
L13           0 S Y O S CE/MAC
L14           0 S ((YTTRIUM()OXYSULFIDE) OR (YTTRIUM()OXYSULPHIDE)) AND (DOPE O
L15           1 S YTTRIUM VANADATE/CN
L16       10290 S Y/MAC
L17       79455 S V/MAC
L18       12906 S O/MAC

     FILE 'HCAPLUS' ENTERED AT 13:45:51 ON 03 APR 2002

     FILE 'REGISTRY' ENTERED AT 13:46:43 ON 03 APR 2002
L19           1 S EUROPIUM/CN
L20           1 S CERIUM/CN

     FILE 'HCAPLUS' ENTERED AT 13:47:44 ON 03 APR 2002
L21         551 S L1 AND L19

     FILE 'REGISTRY' ENTERED AT 13:52:18 ON 03 APR 2002
L22        9750 S EU/ELF
L23       30481 S CE/ELF
L24           0 S (L19 OR L22) AND L1
L25        1120 S (L20 OR L23 OR L12) AND (L9-11)
L26        2153 S (L20 OR L23 OR L12) AND (L16-18)

     FILE 'HCAPLUS' ENTERED AT 13:58:12 ON 03 APR 2002
L27          51 S L1(L)EUROPIUM
L28           0 S L8 (L) CERIUM
L29           4 S L15 (L) CERIUM
L30          57 S (ZNS(W)EU OR ((EU OR EUROPIUM)(2N)(DOPED OR DOPING))(2N)(ZNS
L31          79 S L27 OR L30
L32           1 S (YOS(W)CE OR ((CE OR CERIUM)(2N)(DOPED OR DOPING))(2N)(YOS OR
L33           1 S (YVO(W)CE OR ((YVO OR CERIUM)(2N)(DOPED OR DOPING))(2N)(YVO O
L34        1604 S LIGHT/CT (L) BLUE
L35           0 S L21 AND L34
L36           2 S L6
L37           0 S L21 AND L34
L38          23 S ZINC SULFIDE EUROPIUM

     FILE 'REGISTRY' ENTERED AT 14:51:58 ON 03 APR 2002
L39           1 S PHOSPHORUS/CN

     FILE 'HCAPLUS' ENTERED AT 14:52:33 ON 03 APR 2002
L40           0 S L27 AND (L39 OR PHOSPHORUS)
L41          60 S L31 NOT (L36 OR L38)
L42          17 S L27 AND (L39 OR PHOSPHOR?)
L43          13 S L42 NOT (L36 OR L38)
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L44          31 S L41 AND (DOPE OR DOPING OR DOPED OR DOPANT OR DOPANTS)
L45          28 S L44 NOT (L36 OR L38 OR L42 OR L43)
L46         509 S L21 NOT (L29 OR L32 OR L33 OR L36 OR L38 OR L43 OR L45)
L47         183 S L46 AND (DOPE OR DOPING OR DOPED OR DOPANT OR DOPANTS)
L48         122 S L47 AND (L39 OR PHOSPHOR?)
L49           8 S L48 AND (NM OR NANOMETER OR NANO()METER OR NANOMETRE OR NANO(
                E ELECTROLUMIN/CT
                E E9+ALL/CT
L50       24642 S E18-E37
                E LIGHT-EMITTING/CT
                E E4+ALL/CT
                E LIQUID CRYSTAL DISPLAY/CT
                E E4+ALL/CT
L51       26780 S E13-E26
L52          16 S L48 AND L50
L53           4 S L48 AND L51
L54          19 S (L53 OR L52) NOT L49
L55         730 S L25
L56          18 S L55 AND (NM OR NANOMETER OR NANO()METER OR NANOMETRE OR NANO(
L57          18 S L56 NOT (L54 OR L49 OR L45 OR L43 OR L38 OR L36 OR L33 OR L32
L58           8 S L55 AND (DOPE OR DOPING OR DOPED OR DOPANT OR DOPANTS)
L59           1 S YTTRIUM OXYSULFIDE CERIUM
L60           0 S YTTRIUM OXYSULPHIDE CERIUM
L61           1 S L55 AND L50
L62           0 S L55 AND L51
L63        1288 S L26
L64           8 S L26 AND (DOPE OR DOPING OR DOPED OR DOPANT OR DOPANTS)
L65           6 S GALLIUM INDIUM NITROGEN
                S (GA AND IN AND N)/ELS AND 3/ELC.SUB

    FILE 'REGISTRY' ENTERED AT 15:45:04 ON 03 APR 2002
L66         597 S (GA AND IN AND N)/ELS

    FILE 'HCAPLUS' ENTERED AT 15:45:06 ON 03 APR 2002

    FILE 'REGISTRY' ENTERED AT 15:45:27 ON 03 APR 2002
L67         150 S (GA AND IN AND N)/ELS AND 3/ELC.SUB

    FILE 'HCAPLUS' ENTERED AT 15:45:39 ON 03 APR 2002
L68        3706 S L67
L69        1948 S L68 AND (L51 OR LED OR DIODE OR LIGHT)
L70         189 S L69 AND (UV OR ULTRA()VIOLET)
L71           5 S L39 AND L34
L72          16 S L70 AND (BLUE AND RED)
L73           0 S ZINC SULFIDE EUROPIUM CERIUM

    FILE 'REGISTRY' ENTERED AT 15:54:07 ON 03 APR 2002
L74           0 S (ZN AND S AND EU AND CE)/ELS AND 4/ELC.SUB

    FILE 'HCAPLUS' ENTERED AT 15:54:55 ON 03 APR 2002
L75       17585 S 1314-98-3/RN
L76         143 S (L75 OR L1) AND (L12 OR L20 OR L23) AND (L19 OR L5 OR L22)
L77          99 S L76 AND (L39 OR PHOSPHOR?)
L78          19 S L77 AND ACTIVATOR
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L29 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:288189 HCAPLUS
DN 127:10561
TI Preparation of Eu3+:YVO4 red and Ce3+, Tb3+:LaPO4 green phosphors by hydrolyzed colloid reaction (HCR) technique
AU Erdei, S.; Ainger, F. W.; Ravichandran, D.; White, W. B.; Cross, L. E.
CS Materials Research Laboratory, Pennsylvania State University, University Park, PA, 16802, USA
SO Mater. Lett. (1997), 30(5,6), 389-393
CODEN: MLETDJ; ISSN: 0167-577X
PB Elsevier
DT Journal
LA English
AB Eu3+:YVO4 red and Ce3+, Tb3+:LaPO4 green phosphors were prepd. by newly discovered hydrolyzed colloid reaction (HCR) technique at low temp. (<100.degree.) and atm. pressure using subsequent calcining and reductive treatments, resp. The incorporation of activators (Eu3+ and Ce3+, Tb3+) in these very porous powders was checked by XRD, SEM and luminescence studies.

L29 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:13592 HCAPLUS
DN 108:13592
TI Luminescent properties of yttrium-containing phosphors
AU Merzlyakov, A. T.
CS USSR
SO Sb. Nauchn. Tr. - Vses. Nauchno-Issled. Inst. Lyuminoforov Osobo Chist. Veshchestv (1986), 31, 75-80
CODEN: SNVNAR; ISSN: 0371-1722
DT Journal
LA Russian
AB The luminescence properties were studied for Y3Al5O12:Ce, Y2SiO5:Ce, YBO3:Ce, YVO4:Ce, and YPO4:Tb with various activator concns. Spectra were studied of the luminescence, excitation, and thermoluminescence. For several of the phosphors the energies were detd. of thermal and optical ionization capture centers. A luminescence with .lambda.max = 335 nm was found for samples of Y2CiO5:Ce with an excition nature.

L29 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2002 ACS
AN 1978:606732 HCAPLUS
DN 89:206732
TI Luminescence and optical spectra of terbium and cerium in matrixes of orthovanadates and orthophosphates
AU Gubanov, V. A.; Ryzhkov, M. V.; Zhukov, V. P.
CS USSR
SO Opt. Spektrosk. (1978), 45(2), 317-24
CODEN: OPSPAM; ISSN: 0030-4034
DT Journal
LA Russian
AB By the method of discrete variation Z.alpha., numerical at. orbital calcns. were performed for the clusters PO43-, YO813-, CeO813-, and TbO813- in YPO4-Ce and YPO4-Tb. The results were compared with results of calcns. for YVO4-Ce and YVO4-Tb. A comparison was performed with exptl. optical and luminescence spectra. An interpretation of the spectra is given, and the mechanisms of energy transfer from the excitable anion to an activator atom are considered. The electron configuration of the atoms was found, and the important role of covalency in these compds. was shown.

L29 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2002 ACS
AN 1971:149063 HCAPLUS
DN 74:149063
TI Europium-activated rare earth phosphors containing trivalent cerium brightness control
IN Mathers, James E.; Mehalchick, Emil J.
PA Sylvania Electric Products Inc.
SO U.S., 3 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3574130	A	19710406	US 1969-791771	19690116

AB The brightness of Eu-activated phosphors [Y2O3; Y2O2S; Gd2O3] is improved by adding 1.75 .times. 10-5 to 0.8 .times. 10-3 moles of Ce3+ ion. The oxalates are pptd. by addn. of (parts) oxalic acid 2000 to 5200 of aq. HNO3 contg. 1287 Y2O3 105 Eu2O3, and 0.77 Ce2O3. After filtration and drying in warm air, 2860 NH4 vanadate is added and the mixt. heated to 1750.degree. for 2 hr, cooled, washed with 4000 of 10% NaOH, washed to neutral pH and re-dried. A phosphor lacking Ce2O3 has only 70 to 80% of brightness when excited by uv light.

L32 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:89749 HCAPLUS
DN 120:89749
TI Spectroscopic analysis of proton-induced fluorescence from yttrium orthosilicate
AU Hollerman, W. A.; Fisher, J. H.; Holland, L. R.; Czirr, J. B.
CS Nichols Res. Corp., Huntsville, AL, 35802, USA
SO IEEE Trans. Nucl. Sci. (1993), 40(5), 1355-8
CODEN: IETNAE; ISSN: 0018-9499
DT Journal
LA English
AB In Sept. 1992, the authors completed a 3 MeV proton irradn. test on two yttrium orthosilicate **doped** with **cerium** (**YOS**:**Ce**) crystal samples. The principle goal of this test was to det. the pro.tau..omega..nu. dose required to reduce the resulting **YOS**:**Ce** fluorescence light to half of its original value (half brightness dose) at ambient temp. and 150.degree.. Results from this test will also provide basic information concerning potential changes in spectral compn. and fluorescence peak widths for **YOS**:**Ce** at ambient temps. and 150.degree..

L33 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:274139 HCAPLUS
DN 131:25475
TI Hydrolyzed colloid reaction (HCR) technique for phosphor powder preparation
AU Erdei, S.; Schlecht, R.; Ravichandran, D.
CS Lasergenics Corp., San Jose, CA, 95119, USA
SO Displays (1999), 19(4), 173-178
CODEN: DISPDP; ISSN: 0141-9382
PB Elsevier Science B.V.
DT Journal
LA English
AB Undoped and Eu3+, Ce3+ and Tb3+ -doped YVO4 YPO4, LaPO4 and YVxP1-xO4 were prepd. in H2O by the recently introduced hydrolyzed colloid reaction (HCR) technique working at low temp. (< 100.degree.) and atm. pressure. Two intermediate - partially hydrophobic - complex colloidal mixts. with metastable characteristics can transform into the stable orthovanadate-orthophosphate phase due to intensive hydrolysis. In contrast with the other low temp. reacting processes - like the sol-gel technique, which makes an amorphous structure - the HCR method can produce cryst. structures in nanometer size ranges. The reaction, morphol., incorporation of activators and different luminescent characteristics are surveyed in this letter-type paper selected from the authors' previous results.

L38 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:130112 HCAPLUS
TI Energy transfer between rare earth ions and nanocrystalline matrix in rare earth doped ZnS nanocrystals
AU Liu, Shu-man; Xu, Zheng; Liu, Feng-qi; Xu, Xu-rong
CS Institute of Optoelectronic Technology, Northern Jiaotong University, Beijing, 100044, Peop. Rep. China
SO Zhongguo Xitu Xuebao (2001), 19(6), 566-569
CODEN: ZXXUE5; ISSN: 1000-4343
PB Yejin Gongye Chubanshe
DT Journal
LA Chinese
AB ZnS:Eu3+ and ZnS:Tb3+ nanoparticles were synthesized in a mixt. soln. of H2O and EtOH with methacrylic acid as capping agents. FTIR spectra and x-ray diffraction spectra (XRD) patterns were used to characterize the surface and cubic ZnS cryst. structure of the samples. There is no new phase related to the rare earth elements in the XRD patterns. The luminescent process in the doped nanoparticles was studied by using luminescence and luminescence excitation spectra. The characteristic emission of Tb3+ in ZnS:Tb3+ sample is in part excited by the absorption of ZnS nano-matrix, which indicates the energy transfer between Tb3+ and nano ZnS.

L38 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:262538 HCAPLUS
DN 132:300389
TI Energy structure and fluorescence of Eu2+ in ZnS:Eu nanoparticles
AU Chen, Wei; Malm, Jan-Olle; Zwiller, Valery; Huang, Yining; Liu, Shuman; Wallenberg, Reine; Bovin, Jan-Olov; Samuelson, Lars
CS Centre for Chemical Physics and Department of Chemistry, University of Western Ontario, London, ON, N6A 3K7, Can.
SO Phys. Rev. B: Condens. Matter Mater. Phys. (2000), 61(16), 11021-11024
CODEN: PRBMDO; ISSN: 0163-1829
PB American Physical Society
DT Journal
LA English
AB Eu2+-doped ZnS nanoparticles with an av. size of .apprx.3 nm were prepd., and an emission band around 530 nm was obsd. By heating in air at 150.degree., this emission decreased, while the typical sharp line emission of Eu3+ increased. The emission around 530 nm may be from intraion transition of Eu2+. In bulk ZnS:Eu2+, no intra-ion transition of Eu2+ was obsd. because the excited states of Eu2+ are degenerate with the continuum of the ZnS conduction band. The band gap in ZnS:Eu2+ nanoparticles opens up due to quantum confinement, such that the conduction band of ZnS is higher than the 1st excited state of Eu2+, thus enabling the intraion transition of Eu2+ to occur.
RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L38 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:104607 HCAPLUS
DN 130:231304
TI Assembly of functional materials in zeolites by hydrothermal synthesis method
AU Guoxing, Ba-Tu; Xiao, Feng-Shou; Xu, Ru-Ren
CS Department of Chemistry, Inner Mongulia Normal University, Huhehaote, 010022, Peop. Rep. China
SO Gaodeng Xuexiao Huaxue Xuebao (1998), 19(12), 1900-1903

CODEN: KTHPDM; ISSN: 0251-0790
PB Gaodeng Jiaoyu Chubanshe
DT Journal
LA Chinese
AB By using hydrothermal synthesis methods, materials such as ZnS, MoO3 and org. metallic compds. were assembled into the pores of ZSM-5, forming the function materials with nanometer size, which were studied by XRD, IR, adsorption, UV diffusion reflection and emission spectroscopy techniques.

L38 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:399824 HCAPLUS
DN 129:181436
TI Investigation by ellipsometry and spectrophotometry of ZnS and ZnS:Eu films obtained from volatile complexing compounds
AU Ayupov, B. M.; Ivanova, E. N.; Kovalevskaya, Yu. A.
CS Novosibirsk, Russia
SO Avtometriya (1997), (2), 50-55
CODEN: AVMEBI; ISSN: 0320-7102
PB Izdatel'stvo Sibirskogo Otdeleniya RAN
DT Journal
LA Russian
AB Films of ZnS and Eu-doped ZnS were deposited on Si or glass substrates by thermal dissocn. of the volatile complexing compds., and were investigated by ellipsometry and spectrophotometry. The ZnS films were prepd. by thermal dissocn. of pyridine Zn diisopropylxanthate or 1,10-phenanthroline Zn diethylthiourea, and optionally were doped with 1% Eu from dithiourea compds. The index of refraction for the ZnS films 50-3500 .mu.m thick was uniform with thickness in the presence of anisotropy, but the Eu-doped films showed higher index value near the substrate.

L38 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:686675 HCAPLUS
DN 127:325647
TI Synthesis and properties of ZnS-EuS films grown from volatile complex compounds
AU Bessergenev, V. G.; Ivanova, E. N.; Kovalevskaya, Yu. A.; Vasilieva, I. G.; Varand, V. L.; Zemskova, S. M.; Larionov, S. V.; Kolesov, B. A.; Ayupov, B. M.; Logvinenko, V. A.
CS Institute of Inorganic Chemistry, Siberian Branch of Russian Academy of Sciences, Novosibirsk, 630090, Russia
SO Mater. Res. Bull. (1997), 32(10), 1403-1410
CODEN: MRBUAC; ISSN: 0025-5408
PB Elsevier
DT Journal
LA English
AB Deposition and characterization of films of ZnS, EuS and ZnS:Eu are described. The films were prepd. by CVD using new volatile complex compds., dithiocarbamates of Zn and Eu, as precursors. Characterization includes x-ray diffraction, chem. anal. of the film compn., Raman spectroscopy, ellipsometry, and spectrophotometry. The spatial chem. homogeneity of the films was detd. using a recently developed method of differential dissoln. and is uniform. Doping of ZnS by Eu with dopant concn. up to 0.3 at.% was achieved. Effects of Eu doping on structural and optical properties of the films are presented.

L38 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:279557 HCAPLUS
DN 124:327559
TI Doped semiconductor and insulator nanocrystalline phosphors

AU Goldburt, E. T.; Bhargave, R. N.
CS Nanocrystals Technology, Briarcliff Manor, NY, 10510, USA
SO Proc. - Electrochem. Soc. (1996), 95-25(Advanced Luminescent Materials), 368-381
CODEN: PESODO; ISSN: 0161-6374
DT Journal
LA English
AB This work represents expansion of previous work on Mn-doped ZnS and concs. on prepn. and optical spectrometry of Mn, Eu, and Tb doped into nanocrystals of ZnS and Eu and Tb doped into nanocrystals of yttria. Novel doped nanocryst. phosphors were prepd. using room temp. organometallic synthesis for Zn sulfide and sol-gel processing for yttria host resp. Tb and Eu were used as dopants in both hosts. TEM and photoluminescence and photoluminescence excitation spectrometry yield a typical particle size in the range 40-50 .ANG.. Comparison with std. phosphor, Tb-doped LaOBr, shows that Tb-doped yttria nanocryst. phosphor yields .apprx.30% light output upon 250 nm excitation.

L38 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:237331 HCAPLUS
DN 114:237331
TI Europium-doped zinc sulfide thin film electroluminescent devices prepared by R.F. magnetron sputtering
AU Aozasa, Masao; Chen, Huide; Ando, Keiichi
CS Fac. Eng., Osaka City Univ., Osaka, 558, Japan
SO Thin Solid Films (1991), 199(1), 129-38
CODEN: THSFAP; ISSN: 0040-6090
DT Journal
LA English
AB ZnS:Eu electroluminescent devices with a single insulating layer were prepd. by r.f. magnetron sputtering. The optimum concn. of Eu dopant in the sputtering target is 0.94 mol.%. The luminance level of this device is much lower than that of ZnS:Mn devices at a dopant concn. of about 1.0 mol.%. X-ray diffraction study shows that the crystallinity of ZnS:Eu phosphor is inferior to that of ZnS:Mn phosphor, which is a reason for the poor luminous characteristics of ZnS:Eu devices.

L38 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:449012 HCAPLUS
DN 113:49012
TI Deactivation of the photoionization excitation mechanism of rare-earth intraion emission in zinc sulfide
AU Swiatek, K.; Godlewski, M.
CS Inst. Phys., Pol. Acad. Sci., Warsaw, 02-668, Pol.
SO Appl. Phys. Lett. (1990), 56(22), 2192-4
CODEN: APPLAB; ISSN: 0003-6951
DT Journal
LA English
AB A new, very efficient excitation mechanism of the rare-earth (RE) intraion emission was obsd. recently. This is a process in which the RE ion undergoes ionization and the RE intraion emission is induced when the ionized carrier is recaptured by the RE. The capture process proceeds via an intermediate state due to RE bound exciton (BE), from which the energy is transferred to the RE excited state. Mechanisms are discussed which limit the efficiency of this excitation channel. The first is the thermal dissocn. of the RE BE, which reduces the efficiency of the energy transfer thus quenching the RE intraion emission. An efficient energy transfer from RE BE to Fe2+ centers competes with the transfer of the BE energy to RE core states. These results mean that the practical utilization of the

above excitation mechanism of emission in the RE-activated ZnS devices may be hampered by the common contamination of this material with iron.

L38 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:622460 HCAPLUS
DN 111:222460
TI On the incorporation of rare earth ions into II-VI compounds: europium doped zinc sulfide
AU Swiatek, K.; Godlewski, M.; Hommel, D.; Hartmann, H.
CS Inst. Phys., Pol. Acad. Sci., Warsaw, PL-02-668, Pol.
SO Phys. Status Solidi A (1989), 114(1), 127-33
CODEN: PSSABA; ISSN: 0031-8965
DT Journal
LA English
AB The problem of the incorporation of rare earth (RE) ions into the ZnS lattice is discussed on the basis of ZnS doped with Cu. The symmetry of the Eu center obsd. in ESR measurements was detd. and the concn. estd. from the ESR signal compared with the av. amt. of Cu in the crystals measured by RBS technique. Based on a variety of samples and x-ray data on crystal structure and perfection some conclusions are given on the soly. of RE ions in II-VI compds.

L38 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:487739 HCAPLUS
DN 111:87739
TI X-ray characterization of precipitates in europium-doped mercury telluride and zinc sulfide crystals
AU Jasiolek, Gabriel; Golacki, Zbigniew; Godlewski, Marek
CS Inst. Phys., Pol. Acad. Sci., Warsaw, 02-668, Pol.
SO J. Phys. Chem. Solids (1989), 50(3), 277-82
CODEN: JPCSAW; ISSN: 0022-3697
DT Journal
LA English
AB Quant. anal. on HgTe and ZnS crystals doped with Eu was carried out using an electron probe microanalyzer. The anal. revealed the presence of ppts. enriched in Eu. Concn. of the dopant element in the HgTe crystal was equal to 0.46 and 0.57 wt.% for the ZnS crystal. The ppts. which occurred in the Eu-doped HgTe crystal were identified as the Eu4Te7 phase while the ones found in the Eu-doped HgTe crystal were a mixt. of ZnEu2S4 and ZnS. The presence of trivalent Eu in the ppts. was confirmed by x-ray emission spectroscopic studies.

L38 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1986:616039 HCAPLUS
DN 105:216039
TI Kinetics of luminescence polarization of zinc sulfide single crystals activated with europium and thulium
AU Grigor'ev, N. N.; Ovchinnikov, A. V.; Fok, M. V.
CS USSR
SO Tr. Fiz. Inst. im. P. N. Lebedeva, Akad. Nauk SSSR (1986), 175, 105-23
CODEN: TFILAD; ISSN: 0371-6643
DT Journal
LA Russian
AB During studies of the afterglow of crystals of ZnS:Eu following 10 ns exciting pulses of 337 nm light, the degree of polarization of luminescence increases from 10 to 30% in the course of an example of 10 .mu.s after excitation for all 3 elementary bands ascribed to Eu. Studies of the temp. dependence of the rate of growth of the degree of polarization shows that during ordering orientation the emittance

overcomes a potential barrier with a value at .apprx.0.37 eV. The degree of luminescence polarization of ZnS:Tm decreases according to the time of luminescence from 20 to 0% in several ms.

L38 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1986:78154 HCAPLUS
DN 104:78154
TI Effect of plastic deformation on luminescence and EPR of europium-doped zinc sulfide crystals
AU Arkhangel'skii, G. E.; Grigor'ev, N. N.; Fok, M. V.; Yakunina, N. A.
CS USSR
SO Tr. Fiz. Inst. im. P. N. Lebedeva, Akad. Nauk SSSR (1985), 164, 43-102
CODEN: TFILAD; ISSN: 0371-6643
DT Journal
LA Russian
AB The effect of plastic deformation was studied during uniaxial compression on the luminescence and ESR of ZnS:Eu crystals. Comparison of the paths of transformation of the fault of superimposition of the structure (hexagonal sheets) in the close packing of the at. layers of the cubic lattice of the ZnS crystals in the time of deformation with obsd. changes in the ESR spectra and polarization of the luminescence leads to an explanation of the structure of centers, formed by Eu. Eu2+ ions, located at Zn2+ lattice nodes, produce several types of centers of nonassociative character, responsible simultaneously for the luminescent and paramagnetic properties of the ZnS:Eu crystals. Three types of centers with axial symmetry of nearest environment and 1 type of center with cubic symmetry exist. Axial centers are found in 1-, 2-, and 3-layered faults of superimposition of the hexagonal structure but cubic centers in regular ZnS lattice sites. The large degree of polarization of the luminescence is related to inner crystal fields, induced by faults of superimposition, leading to the orientation of the emitting and absorbing Eu2+ dipole centers.

L38 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1985:214302 HCAPLUS
DN 102:214302
TI Polyhydroxyflavones as extraction reagents. 7. Extraction of europium complexes using morin from alkaline media
AU Blank, A. B.; Belenko, L. E.
CS All-Union Sci.-Res. Inst. Monocryst. Scintill. Mater. Spec. Purity Chem., Kharkov, USSR
SO Zh. Anal. Khim. (1985), 40(3), 461-5
CODEN: ZAKHA8; ISSN: 0044-4502
DT Journal
LA Russian
AB Eu3+ was detd. in ZnS luminophors and MoO3 by extn. of NH4[Eu(OH)LH3] (LH5 = morin) from ammoniacal solns. (pH 9.5) into 20% Bu3PO4 in isoamyl alc. and measuring its absorbance at 430 nm. The extn. of morin complexes with Eu was studied as a function of pH. Extn. consts. and molar absorptivities were detd.

L38 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:540293 HCAPLUS
DN 101:140293
TI Hydrostatic pressure effect on emission spectra of europium(2+)-doped zinc sulfide and europium(2+)-doped yttrium oxide sulfide (Y2O2S)
AU Wang, Lizhong; Zhang, Zaixuan; Chi, Yuanbin; Liu, Shensin
CS Inst. At. Mol. Phys., Jilin Univ., Changchun, Peop. Rep. China
SO Mater. Res. Soc. Symp. Proc. (1984), 22(High Pressure Sci. Technol., Pt.

3), 345-8
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
AB Emission spectra of ZnS:Eu2+ and Y2O2S:Eu3+ were measured under hydrostatic pressure up to 156 and 40 kb, resp., at room temp. to gain insight into their luminescence mechanism at ambient pressure. The large difference between Eu2+ and Eu3+ in the pressure dependence of the emission frequency and half-width shows that the 4f electrons are shielded form the surrounding lattice by 5s2 and 5p6 electrons and thus are effected only weakly by changes in the environment.

L38 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:430554 HCAPLUS
DN 101:30554
TI High pressure studies on the emission spectrum of europium-doped zinc sulfide
AU Chi, Yuanbin; Wang, Lizhong; Zhang, Zaixuan
CS Inst. At. Mol. Phys., Jilin Univ., Changchun, Peop. Rep. China
SO Jilin Daxue Ziran Kexue Xuebao (1984), (2), 83-8
CODEN: CLTTDI
DT Journal
LA Chinese
AB High pressure luminescence measurements were made on ZnS doped with Eu2+ up to 156 kbar using a diamond anvil cell. An Ar laser (.lambda. = 4880 .ANG.) is taken as the excitation source. The measured data include the changes of the emission peak location, half-width and intensity. The emission peak (~.nu.0 = 18,300 cm-1) shifts strongly to the lower energy with increasing pressure. In the range of pressure from 0 to 78 kbar, the obsd. peak shift (in cm-1) are fit linearly .DELTA.~.nu. = -21.6P. The half-widths, E1/2 (in cm-1), show a tendency to decrease with pressure: E1/2 = 1700-1.4P. The intensity of the emission peak increases drastically with increasing pressure. From 10 to 78 kbar the intensity increases .apprx.5 times. At .apprx.86 kbar the original emission peak disappears, while a new one (.apprx..nu.* = 16,000 cm-1) appears. The new peak has a wide halfwidth (.apprx.2450 cm-1) and shifts to the lower energy at a rate of approx. (-137 + 0.93P) cm-1/kbar. Its intensity drops precipitously. This emission band would be quenched at pressure >156 kbar, at which ZnS has changed from the cubic to NaCl phase, and which agrees very well with the transition pressure detected elec. bu using the change in resistance. The large red shift can be understood qual. with the crystal field theory.

L38 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:147947 HCAPLUS
DN 100:147947
TI Infrared-to-visible conversion process in electroluminescent **zinc sulfide**:**europium**(III) fluoride, ytterbium(III) fluoride phosphor
AU Nakano, Ryotaro; Kawasaki, Hiroshi; Sato, Jun; Yabumoto, Tadaichi
CS Sch. Eng., Meiji Univ., Kawasaki, 214, Japan
SO Oyo Butsuri (1983), 52(9), 806-8
CODEN: OYBSA9; ISSN: 0369-8009
DT Journal
LA Japanese
AB In the doubly insulated thin-film electroluminescent device using ZnS:ErF3, YbF3 as emission layer, the emitted radiation changes from green to red with an increase of the elec. field excitation frequency. To clarify the mechanism of energy transfer from Yb3+ to Er3+, a

spectroscopic study was made. By exciting the phosphor with 950-nm radiation, both of the green and red emission bands of Er3+ ion showed a quadratic dependence on the excitation power, whereas the red-to-green emission intensity ratio increased with increasing the emission pulse width.

L38 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:26915 HCAPLUS
DN 96:26915
TI Effect of europium and gadolinium impurities on the crystal structure of zinc sulfide single crystals
AU Kovalenko, A. V.; Sharlai, E. G.
CS USSR
SO Zh. Prikl. Spektrosk. (1981), 35(5), 900-3
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
AB The effects of Eu and Gd on the growth of ZnS crystals under Ar pressure was studied for melts contg. Eu or Gd concns. of 1.67 .times. 1019 cm-3 by ESR and x-ray diffractometry. The rare earths initiate stacking faults in the initially cubic crystals which lead to hexagonal phase growth. Gd induces more hexagonal-phase formation than Eu.

L38 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:129908 HCAPLUS
DN 94:129908
TI EPR of europium(2+) ions in normal and defect points of a zinc sulfide crystal lattice
AU Arkhangel'skii, G. E.; Kovalenko, A. V.; Lyfar, D. L.; Shtambur, I. V.; Yakunina, N. A.
CS USSR
SO Zh. Prikl. Spektrosk. (1981), 34(2), 361-3
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
AB The symmetry of the local intracryst. fields of ZnS crystals and changes of the fields during plastic deformation were studied by ESR. Within the ZnS lattice Eu2+ ions form 4 types of centers: 1 cubic center (40% of the Eu2+ ions) and 3 axial centers (42, 2, and 16% of the Eu2+ ions). The spin Hamiltonian parameters of all the centers were detd. With 18-20% deformation, no axial ESR spectra of Eu2+ ions were obsd. in ZnS as a result of complete transformation of the hexagonal phase to cubic phase.

L38 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:23123 HCAPLUS
DN 94:23123
TI Structural changes in zinc sulfide crystals in plastic deformation
AU Arkhangel'skii, G. E.; Fok, M. V.; Yakunina, N. A.
CS USSR
SO Kratk. Soobshch. Fiz. (1980), (3), 8-13
CODEN: KRSFAU; ISSN: 0455-0595
DT Journal
LA Russian
AB The defect changes during the plastic-deformation-induced hexagonal-cubic transition of ZnSiEu were studied by EPR. The transition is produced by stacking-fault interactions. The amt. of hexagonal phase was monitored by the difference in soly. of Eu2+ in it and the cubic phase. A mechanism for the polytype transition is given.

L38 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1980:596497 HCAPLUS
DN 93:196497
TI Blue luminescent material
PA Kasei Optonix, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 55073778	A2	19800603	JP 1978-146766	19781128
	JP 61050117	B4	19861101		

AB The blue luminescent material was prepd. by doping Eu into a Ag-activated ZnS luminescent substance. The Eu dopant had a concn. of 3 .times. 10-5-5 .times. 10-4 g per 1 g of ZnS.

L38 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1977:36851 HCAPLUS
DN 86:36851
TI Study of "lumocen" centers in the tantalum-tantalum oxide-zinc sulfide: rare earth metal fluoride-gold electroluminescent devices
AU Benoit, Jacques; Benalloul, Paul; Charreire, Yves; Blanzat, Bernard
CS Lab. Lumin. II, Univ. Paris VI, Paris, Fr.
SO Mater. Res. Bull. (1976), 11(11), 1463-9
CODEN: MRBUAC
DT Journal
LA French
AB Electroluminescence and cathodoluminescence expts. were carried out on Ta-Ta2O5-ZnS:LnF3-Au films whose electroluminescent layer is formed by the co-evapn. of ZnS and LnF3. Trivalent Eu was used as a probe for the rare earth point symmetry, and a nephelanxetic effect (C. K. Jorgensen, 1962) was obsd. for almost all the rare earths. The ionic bond between the rare earth and F ions is significantly modified by embedding the mol. LnF3 in the ZnS lattice.

L38 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1976:438973 HCAPLUS
DN 85:38973
TI Sensitization of the fluorescence of europium(3+) doped zinc sulfide by gadolinium or lanthanum ions
AU Grillot, Edmond; Bancie-Grillot, Marguerite
CS Univ. Paris VI, Paris, Fr.
SO Proc. Rare Earth Res. Conf., 10th (1973), Volume 2, Issue CONF-730402-P2, 1160-9. Editor(s): Kevane, Clement J.; Moeller, Therald. Publisher: NTIS, Springfield, Va.
CODEN: 33DSAV
DT Conference
LA English
AB While in the absence of Gd3+, insignificant luminescence is obsd. for Eu3+ in ZnS, about 40 lines with different but the same order of magnitude intensities were obsd. in the fluorescence spectrum of ZnS prepd. with 1% Gd3+, and 10-4% Eu3+, plus Co to eliminate the blue and green bands due to Cu. Upon increasing the Eu3+ concn., while maintaining the Gd3+ concn. const., the relative intensities of the lines changes and the abs. intensity of the red lines increases considerably. The lines can be classified in good agreement with the transitions of the Eu3+ ions. The associative effect of La3+ is even stronger than that of Gd3+, giving rise

to a bright red emission. Comparison of the effects of Ge3+ and La3+ indicates that the 2nd lanthanide modifies the ligand field of Eu3+, implying that the 2 ions are close together in the lattice.

L38 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2002 ACS
AN 1973:541132 HCAPLUS
DN 79:141132
TI Effect of lattice structure on the luminescence and EPR of europium-activated zinc sulfide
AU Arkhangel'skii, G. E.; Gorbacheva, N. A.; Fok, M. V.
CS USSR
SO Zh. Prikl. Spektrosk. (1973), 19(3), 460-3
CODEN: ZPSBAX
DT Journal
LA Russian
AB The effect of lattice structure on the luminescence and EPR of ZnS:Eu was studied for a series of phosphors. The phosphors were prepd. by the calcination of ZnS with a Eu-contg. mixt. at 1200.degree. for 30 min in a H2S atm. The Eu concn. in the mixt. was 10-4, 5 .times. 10-4, 2.5 .times. 10-3.5, 5 .times. 10-3, and 10-2 g/g. The lattice of the prepd. phosphors had mainly a hexagonal structure. The spectra of the samples were measured at 77.degree.K by excitation with the Hg lines at 313 and 365 nm. The elementary absorption bands of the emission spectrum of ZnS:Eu, the valence of Eu in ZnS, as well as the effect of the lattice structure on the electron transitions of these ions are given and discussed.

L43 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:420320 HCAPLUS
DN 133:80969
TI Preparation and characterization of rare earth activator doped nanocrystal **phosphors**
AU Ihara, M.; Igarashi, T.; Kusunoki, T.; Ohno, K.
CS Sony Corporation, Home Network Company, Atsugi, 243-0021, Japan
SO Journal of the Electrochemical Society (2000), 147(6), 2355-2357
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
AB The luminescent intensities of nanocrystal ZnS:Tb and ZnS:Eu synthesized using a new technique were 2.5 and 2.8 times higher than those of bulk **phosphors**. Taking charge compensation into account, the luminescent efficiency of the nanocrystals can be improved. The cathodoluminescence of the nanocrystals was obsd. These nanocrystal **phosphors** are promising for field emission display, electroluminescence, plasma-display panels, and cathode ray tubes.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:176854 HCAPLUS
DN 120:176854
TI Growth of Y2O2S:Eu thin films by reactive magnetron sputtering and electroluminescent characteristics
AU Sowa, Kunihiro; Tanabe, Masami; Furukawa, Seigo; Nakanishi, Yoichiro; Hatanaka, Yoshinori
CS Dep. Electron., Nippondenso Tech. Coll., Takatana, 446, Japan
SO Jpn. J. Appl. Phys., Part 1 (1993), 32(12A), 5601-2
CODEN: JAPNDE; ISSN: 0021-4922
DT Journal
LA English
AB Y2O2S:Eu **phosphor** films were prepd. by reactive magnetron sputtering with a Y2O3:Eu target in a H2S and Ar mixed atm., and hot carrier injection-type electroluminescent devices with Y2O2S:Eu/ZnS/Y2O2S:Eu structure were fabricated. The crystal structure of Y2O2S:Eu films depends on the S concn. in the film. With increasing at. ratios of S/Y, the crystal phase is changed from cubic to hexagonal. Luminescent spectra from the films are dependent on the crystal structures.

L43 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:482665 HCAPLUS
DN 119:82665
TI Electroluminescent cell using a zinc sulfide host including molecules of a ternary europium tetrafluoride compound
IN Kahng, Dawon; Yoshioka, Toshihiro
PA NEC Research Institute, Inc., USA
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5198721	A	19930330	US 1991-690587	19910224

	JP 06260285	A2	19940916	JP 1992-105085	19920424
	JP 07048399	B4	19950524		
	US 5286517	A	19940215	US 1992-927617	19920807
PRAI	US 1991-690587		19910224		

AB Electroluminescent displays are described which employ a stack of 3 cell arrays: a red-emitting cell array comprising polycryst. ZnS hosting LiEuF4, a blue-emitting cell array comprising polycryst. ZnS hosting BeEuF4, and a green-emitting cell array comprising polycryst. ZnS hosting TbF3.

L43 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:144015 HCAPLUS
DN 110:144015
TI Line spectrum emission of europium-activated zinc sulfide
AU Kynev, K.; Kuk, V.
CS Dep. Inorg. Chem., Univ. Sofia, Bulg.
SO Z. Naturforsch., A: Phys. Sci. (1989), 44(1), 81-3
CODEN: ZNASEI; ISSN: 0932-0784
DT Journal
LA English
AB It is shown that a ZnS:Eu **phosphor** with line emission spectrum can be prepd. without coactivator introduction, contrary to previous results. The broad-band emission established in ZnS:Eu,Li is ascribed to the formation of Eu2+ centers due to the removal of lattice stress by lithium incorporation.

L43 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:176456 HCAPLUS
DN 108:176456
TI A new nonradioactive night-luminous **phosphor**
AU Mao, Xianghui; Wu, Zhengguo; Feng, Yunsheng
CS Hunan Norm. Univ., Changsha, Peop. Rep. China
SO J. Lumin. (1988), 40-41, 891-2
CODEN: JLUMA8; ISSN: 0022-2313
DT Journal
LA English
AB The results are reported on the synthesis of ZnS:Pb,Cu,Eu and its luminescent properties.

L43 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1986:635447 HCAPLUS
DN 105:235447
TI Red-emitting **phosphors**
IN Wakatsuki, Tadashi; Takahara, Takeshi
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 61136578	A2	19860624	JP 1984-255731	19841205
	JP 05022747	B4	19930330		

AB Eu-activated Y2S3-based **phosphors**, uncoated or coated with Fe oxide, are surface coated with ZnS 0.003-0.2 wt.% to give red-emitting **phosphors**. The **phosphors** show good dispersion in aq. solns., and are useful for fabrication of color cathode-ray tubes with improved luminosity. Thus, a powdery Eu-activated Y2S3-based phoshor was

treated with an aq. soln. contg. ammonium polysulfide and ZnSO4, then the treated **phosphor** was washed with water, dried, and sieved to obtain a **phosphor** surface-coated with ZnS 0.0035 wt.%. A color cathode-ray tube fabricated with the **phosphor** thus prepd. gave a relative luminosity 102 vs. 100 for a control cathode-ray tube fabricated with a noncoated **phosphor**.

L43 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:111994 HCAPLUS
DN 100:111994
TI White light-emitting **phosphor**
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 58162688	A2	19830927	JP 1982-44513	19820323

AB White-light luminescent materials contain Ag-activated ZnS, a Eu-activated luminescent compd., and 20-60 wt.% of Ce-activated CaS as green-luminescent material. The luminescent materials contain no poisonous element such as Cd, show high luminescent intensity, and do not change with increasing elec. current, and are thus useful for black-and-white television. Thus, Ag-activated ZnS, Eu-activated Y2O2S, and Ce-activated CaS were mixed at 25, 24, and 41 wt.%, resp., to obtain a white-light luminescent material, which showed excellent characteristics.

L43 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1978:498722 HCAPLUS
DN 89:98722
TI Treatment of rare earth **phosphors** contaminated with sulfide **phosphors**
IN Fujiwara, Kotoji; Yashima, Koji; Awazu, Kenzo; Ishii, Takashi
PA Mitsubishi Electric Corp., Japan
SO Japan. Kokai, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 53037188	A2	19780406	JP 1976-112054	19760918
JP 53031830	B4	19780905		

AB Rare earth **phosphors** (e.g. Y2O2:Eu) contaminated with sulfide **phosphors** [e.g. ZnS:Ag, (Zn, Cd)S:(Cu, Al)] are treated with Ag+ or on aq. suspension contg. Ag and H2O2 to form a Ag2S coating on the sulfide **phosphor** to suppress its emission and to serve to recover the color purity of the rare earth **phosphor**.

L43 ANSWER 9 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1978:31119 HCAPLUS
DN 88:31119
TI Mixed metal sulfide **phosphors**
IN Yoshida, Chihiro; Hase, Takashi; Shimoda, Masahiro
PA Dainippon Toryo Co., Ltd., Japan
SO Japan. Kokai, 11 pp.
CODEN: JKXXAF

DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 52124485	A2	19771019	JP 1976-42088	19760414

AB At least one selected from Ca, Sr, and Ba compds., a Ga compd., and a Eu compd., all convertable into the sulfides in a reducing-sulfiding atm. at high temp., and a Zn additive are mixed to give a material with an alk. earth sulfide:Ga sulfide:Eu:Zn ratio of 1 g mol.:(0.8-1.4) g mol:(10-4-5 .times. 10-1) g atom:.ltoreq. 4 .times. 10-1 g atom then heated at 700-1100.degree. in a reducing-sulfiding atm. The Zn compd. stabilizes the **phosphor** which is useful in color television screens. Thus, a mixt. of Ga2O3, SrSO4 1, Eu2O3 0.015, and ZnS 0.11 mol was ball-milled, heated at 800.degree. for 5 h in an H2S stream, washed with H2O, dried, and sieved.

L43 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1977:475906 HCAPLUS
DN 87:75906
TI The origin of the fluorescence of trivalent europium embedded in zinc sulfide matrixes
AU Charreire, Yves; Loriers, Jean
CS Groupe Lab. Bellevue, CNRS, Meudon, Fr.
SO C. R. Hebd. Seances Acad. Sci., Ser. B (1977), 284(21), 475-8
CODEN: CHDBAN
DT Journal
LA French
AB The red fluorescence of Eu3+ assocd. in ZnS with another but optically inactive lanthanide ion (La, Gd) originates from rare earth oxysulfide inclusions, that are always formed during the prepn. of the compds. This interpretation results from the examn. of the materials by x-ray diffraction, optical and electronic microscopy and from the study of their absorption, excitation and luminescence spectra. It allows one to understand some of the obsd. properties, which were left unexplained by the assumption that the Eu3+ ions enter the ZnS crystal lattice.

L43 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1976:187094 HCAPLUS
DN 84:187094
TI Emission spectra of crystal **phosphors** with rare earth activators during excitation by atomic hydrogen
AU Sokolov, V. A.; Khoruzhii, V. D.; Styrov, V. V.
CS USSR
SO Spektrosk. Krist., Dokl. Soveshch. Spektrosk. Akt. Krist., 4th (1975), Meeting Date 1973, 295-7. Editor(s): Kaminskii, A. A.; Morgenshtern, Z. L.; Sviridov, D. T. Publisher: "Nauka", Moscow, USSR.
CODEN: 32SVA6
DT Conference
LA Russian
AB The luminescence spectra of the crystal **phosphors** (ZnS-Sm, ZnS-Eu, Y2203-Eu, AlN-Eu) were studied during excitation by recombination of H atoms on the surface. Significant differences of the spectral features for the surface centers are obsd. in comparison to bulk centers: they better expressed the linear structure of the spectra, the appearance of new lines, and other valent states of the activator on the surface.

L43 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1969:526585 HCAPLUS

DN 71:126585
TI Recovering rare earths
IN Pobiner, Harvey
PA American Can Co.
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3468622	A	19690923	US 1967-645896	19670614

AB Eu2O3 can be recovered from mixts. with other rare earths or ZnO by acidifying the mixt. with an aq. acid and complexing the Eu with a dipolar aprotic solvent, such as HCONMe2, Me2SO, dimethylacetamide, or hexamethyl-**phosphoramide** to form a sol. Eu salt complex. The solids are removed from the soln. and the Eu is deposited as pure Eu2O3 by adjusting the soln. pH to 10.5. NaOH is used for rare earth mixts. and NH4OH is used when Zn is present.

L43 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2002 ACS
AN 1968:54857 HCAPLUS
DN 68:54857
TI Recovering excess vanadate **phosphor** removed from a cathodoluminescent screen
IN Levine, Albert Kenneth; Palilla, Frank C.
PA General Telephone and Electronics Laboratories, Inc.
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3348924		19671024	US	19660325

AB The disclosure is the same but the claims are different.

L45 ANSWER 1 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:231246 HCAPLUS
TI Cathodoluminescence and photoluminescence of nanocrystal phosphors
AU Ihara, M.; Igarashi, T.; Kusunoki, T.; Ohno, K.
CS Sony Corporation, Atsugi, 243-0021, Japan
SO Journal of the Electrochemical Society (2002), 149(3), H72-H75
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
AB Nanocrystals of Tb- or **Eu-doped ZnS** were prepd. using a new technique yielding high luminescent efficiency. The photoluminescent intensities of nanocrystal ZnS:Tb and **ZnS**: **Eu** were about three times higher than those of bulk phosphors. These nanocrystals were coated by a glass ingredient. The cathodoluminescent efficiency was improved by contriving the synthesis of glass-ingredient-coated nanocrystals. The cathodoluminescent intensities of the nanocrystals were more than ten times higher than those of uncoated nanocrystals. While the compn. of uncoated nanocrystal phosphor changed by electron bombardment, the glass-ingredient-coated nanocrystal phosphor was protected from surface oxidn. Glass ingredient plays a role in the redn. of phosphor degrdn. by bombardment of electron-beams.

L45 ANSWER 2 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:91259 HCAPLUS
DN 136:223544
TI Difference in luminescence properties between Sm **doped** **ZnS** and **Eu doped ZnS**
AU Abiko, Y.; Nakayama, N.; Akimoto, K.; Yao, T.
CS Institute of Applied Physics, University of Tsukuba, Tsukuba, 305-8573, Japan
SO Physica Status Solidi B: Basic Research (2002), 229(1), 339-342
CODEN: PSSBBD; ISSN: 0370-1972
PB Wiley-VCH Verlag Berlin GmbH
DT Journal
LA English
AB A sharp luminescence peak from Sm **doped** ZnS at 650 nm which can be assigned as 4G5/2-6H9/2 transition of Sm3+ ion was obsd.; however, no luminescence peak related to Eu3+, which can have luminescence in the similar spectral region, was obsd. from **Eu doped** **ZnS**. A defect level situated at .apprx.0.36 eV above the valence band was detected only in Sm **doped** ZnS by IR absorption spectroscopy. The cause of the difference in the luminescence properties between Sm **doped ZnS** and **Eu doped** **ZnS** was reasonably explained by the model of defect related energy transfer assocd. with the 0.36 eV level.
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 3 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:141213 HCAPLUS
DN 134:287305
TI Size dependence of Eu2+ fluorescence in ZnS:Eu2+ nanoparticles
AU Chen, Wei; Malm, Jan-Olle; Zwiller, Valery; Wallenberg, Reine; Bovin, Jan-Olov
CS Nomadics Incorporated, Stillwater, OK, 74074, USA
SO Journal of Applied Physics (2001), 89(5), 2671-2675
CODEN: JAPIAU; ISSN: 0021-8979

PB American Institute of Physics
DT Journal
LA English
AB The emission bands of the 4.2, 3.2 and 2.6 nm sized ZnS:Eu2+ nanoparticles are peaking at 670, 580 and 520 nm, resp. The emission of the 4.2 nm sized nanoparticles originates from the recombination of the Eu2+-bound exciton, while the emission of the 3.2 and 2.6 nm sized nanoparticles is from the Eu2+ intra-ion transition of 4f65d1(t2g)-4f7. Possible mechanisms for the size dependence of the 4f65d1(t2g)-4f7 transition of Eu2+ in ZnS:Eu2+ nanoparticles were studied, and the decreases in the electron-phonon coupling and in crystal field strength upon a decrease in size are the two major factors responsible for the shift.
RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 4 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:15961 HCAPLUS
DN 134:216347
TI Synthesis and luminescent properties of ZnGa2S4:Eu,F and ZnGa2O4:Eu,F
AU Tagiev, B. G.; Guseinov, G. G.; Dzhabbarov, R. B.; Tagiev, O. B.; Musaeva, N. N.; Georgobiani, A. N.
CS Institute of Physics, Academy of Sciences of Azerbaijan, Baku, 370143, Azerbaijan
SO Inorganic Materials (Translation of Neorganicheskie Materialy) (2000), 36(12), 1189-1191
CODEN: INOMAF; ISSN: 0020-1685
PB MAIK Nauka/Interperiodica Publishing
DT Journal
LA English
AB ZnGa2S4:Eu,F and ZnGa2O4:Eu,F were synthesized and characterized by x-ray diffraction and photoluminescence (PL) measurements. ZnGa2S4:Eu,F has a tetragonal structure (sp. gr. D2d11 = I42m) with a 5.272 and c 10.451 .ANG., and ZnGa2O4:Eu,F has a cubic structure (sp. gr. Fd3m) with a 8.32 .ANG.. The PL spectrum of ZnGa2S4:Eu,F consists of a broad band (FWHM = 1.11 eV) at 565 nm due to the Eu2+ 5D1 .fwdarw. 7F2 transition, and the spectrum of ZnGa2O4:Eu,F shows four emissions due to the Eu3+ 5D0 .fwdarw. 7F4 (.lambda.max = 682 nm), 5D0 .fwdarw. 7F2 (.lambda.max = 615 nm), 5D0 .fwdarw. 7F1 (.lambda.max = 595 nm), and 5D0 .fwdarw. 7F0 (.lambda.max = 584 nm) transitions.
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 5 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:677460 HCAPLUS
DN 133:259062
TI Phosphors and manufacture
IN Ihara, Masaru; Igarashi, Takahiro; Kusunoki, Tsuneo; Ohno, Katsutoshi
PA Sony Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000265166	A2	20000926	JP 1999-89081	19990330
PRAI	JP 1999-8039	A	19990114		

AB The phosphors comprise: a nanoparticle coated with a glass comprising a polymd. gel of tetraethoxysilane, where the particle comprise ZnS:Tb,

ZnS:TbF3, **ZnS:Eu** and ZnS:EuF3.

L45 ANSWER 6 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:659413 HCAPLUS
DN 133:367400
TI Photoluminescence of Eu2+ **doped** ZnS nanocrystals
AU Liu, Shu-Man; Guo, Hai-Qing; Zhang, Zhi-Hua; Liu, Feng-Qi; Wang, Zhan-Guo
CS Laboratory of Semiconductor Materials Sciences, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep. China
SO Chinese Physics Letters (2000), 17(8), 609-611
CODEN: CPLEEU; ISSN: 0256-307X
PB Chinese Physical Society
DT Journal
LA English
AB Eu2+ **doped** ZnS nanocrystals exhibit new luminescence properties because of the enlarged energy gap of nanocryst. ZnS host due to quantum confinement effects. Photoluminescence emission at about 520 nm from Eu2+ **doped** ZnS nanocrystals at room temp. is investigated by using photoluminescence emission and excitation spectroscopy. Such green emission with long lifetime (ms) is proposed to be a result of excitation, ionization, carriers recapture and recombination via Eu2+ centers in nanocryst. ZnS host.
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 7 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:732416 HCAPLUS
DN 131:358522
TI The site symmetry of Eu3+ in **ZnS:Eu** nanoparticle
AU Sun, Xiao Lin; Zhang, Gui Lan; Tang, Guo Qing; Chen, Wen Ju
CS Opto-electronic Information Science and Technology Lab., MOE., Institute of Modern Optics, Nankai University, Tianjin, 300071, Peop. Rep. China
SO Chin. Chem. Lett. (1999), 10(9), 807-810
CODEN: CCLEE7; ISSN: 1001-8417
PB Chinese Chemical Society
DT Journal
LA English
AB Nanosized ZnS **doped** with different concns. of Eu3+ were prepd. and analyzed by x-ray diffraction technique. The exptl. results show that ZnS belongs to the cubic structure. From the photoluminescence emission spectra, it can be seen that the ratio of the emission intensity of Eu3+ at 616 nm to that at 590 nm increases as the increasing of Eu3+. This phenomenon reveals that the site symmetry of Eu3+ reduces as the increasing of Eu3+.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 8 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:73732 HCAPLUS
DN 130:202350
TI Photoluminescence of **ZnS** nanoparticles **doped** with **europium** ions in a polymer matrix
AU Papakonstantinou, D. D.; Huang, J.; Lianos, P.
CS Engineering Science Department, University of Patras, Patras, 26500, Greece
SO J. Mater. Sci. Lett. (1998), 17(18), 1571-1573
CODEN: JMSLD5; ISSN: 0261-8028
PB Kluwer Academic Publishers

DT Journal
LA English
AB In this letter, we report the synthesis of ZnS nanocrystals with a diam. of about 4.0 nm. Their photophys. properties have been studied in the presence of metal ions. Trivalent ions, e.g., europium and other rate earth ions greatly enhance photoluminescence yield . The exclusivity of trivalent ions stems from the fact that they are strongly attracted to the polymer matrix by interaction with oxygen.
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 9 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:473140 HCAPLUS
DN 129:222662
TI Luminescence characteristics of impurities-activated ZnS nanocrystals prepared in microemulsion with hydrothermal treatment
AU Xu, S. J.; Chua, S. J.; Liu, B.; Gan, L. M.; Chew, C. H.; Xu, G. Q.
CS Institute of Materials Research and Engineering, National University of Singapore, Singapore, 119260, Singapore
SO Appl. Phys. Lett. (1998), 73(4), 478-480
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
AB Cu-, **Eu**-, or Mn-**doped ZnS** nanocryst.
phosphors were prepd. at room temp. using a chem. synthesis method. TEM observation shows that the size of the ZnS clusters is 3-18 nm. New luminescence characteristics such as strong and stable visible-light emissions with different colors were obsd. from the **doped** ZnS nanocrystals at room temp. Probably impurities, esp. transition metals- and rare earth metals-activated ZnS nanoclusters form a new class of luminescent materials.

L45 ANSWER 10 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:467041 HCAPLUS
DN 129:251953
TI Study of the optical properties of Eu3+-**doped** ZnS nanocrystals
AU Sun, Lingdong; Yan, Chunhua; Liu, Changhui; Liao, Chunsheng; Li, Dan; Yu, Jiaqi
CS State Key Laboratory of Rare Earth Materials Chemistry and Applications, Peking University, Beijing, 100871, Peop. Rep. China
SO J. Alloys Compd. (1998), 275-277, 234-237
CODEN: JALCEU; ISSN: 0925-8388
PB Elsevier Science S.A.
DT Journal
LA English
AB Absorption and luminescence excitation spectra are presented for **ZnS**:**Eu** nanocrystals. The av. size of the **ZnS**:
Eu nanocrystals was .apprx.3.6 nm deduced from the absorption spectra and was independent of the **doping** concn. of Eu3+. The characteristic luminescence from the 5D0-7FJ (J = 0, 1, 2) transition of Eu3+ was obsd. This is attributed to the electrons and holes being localized around Eu3+, and the possibility of energy transfer from band to band excitation in ZnS to trivalent rare earth Eu3+ is increased. The location of Eu3+ is different for different **doping** concns.
deduced from the relative luminescence intensity. Three main types of Eu3+ ion exist in the colloid. The samples undergo growth and aging processes according to the variation of the luminescence intensity after prepn. A tentative explanation is given that the location of Eu3+ and the

surface states may play important roles.

L45 ANSWER 11 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:425834 HCAPLUS
DN 127:142253
TI Optical properties of Eu3+ **doped** ZnS colloids
AU Yan, Chunhua; Sun, Lingdong; Li, Dan; Yu, Jiaqi
CS State Key Lab. Rare Earth Chem. Appl., Peking Univ., Beijiing, 100871, Peop. Rep. China
SO Kidorui (1997), 30, 188-189
CODEN: KIDOEP; ISSN: 0910-2205
PB Nippon Kidorui Gakkai
DT Journal
LA English
AB The authors report the synthesis and optical properties of Eu3+ **doped** ZnS colloids. The samples were synthesized by sol-gel method. The size of the particles is 3.6 nm. The energy transfer from ZnS band to band excitation to Eu3+ is efficient, and the characteristic luminescence from 5D0-7FJ (J = 0, 1, 2) can be obsd. By measuring spectra at different stages the luminescence intensity changed drastically which corresponding to the growing and aging processes. A tentative explanation is given and the surface states play an important role in these effects.

L45 ANSWER 12 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:98936 HCAPLUS
DN 124:188346
TI Recombination processes in II-VI compounds **doped** with transition metal ions
AU Godlewski, M.; Surma, M.; Zakrzewski, A. J.
CS Institute of Physics, Polish Academy of Sciences, Warsaw, 02-668, Pol.
SO Zh. Prikl. Spektrosk. (1995), 62(4), 72-87
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA English
AB Transition metal (TM) ions such as Cr or Mn were used as emission activators in wide band gap I-VI phosphor materials. However, they belong to common inadvertent **dopants** in these semiconductors and some of them act as centers of nonradiative recombination. The relevant mechanisms of photoluminescence deactivation are discussed. The so-called bypassing process is described. In this process TM ions act as efficient recombination centers for both electrons and holes, due to their relatively large cross sections for carrier trapping. Several other processes contribute to the overall efficiency of nonradiative decay via TM ions, such as: three center Auger processes, energy transfer processes from donor-acceptor pairs (DAPs) to TM ions, and carrier tunneling from deep TM related centers. In a three center Auger transition DAP decays non-radiatively due to energy transfer to a nearby TM ion which is then ionized. DAP-TM transfer may also result in TM or rare earth ion intra-shell excitation. The role of assocs. of emission activator-emission deactivator is also discussed.

L45 ANSWER 13 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:778325 HCAPLUS
DN 123:302547
TI Rare earth ionization, carrier trapping, and exciton binding
AU Godlewski, M.
CS Institute of Physics, Polish Academy of Sciences, Al. Lotnikow 32/46, Warsaw, 02-668, Pol.
SO J. Alloys Compd. (1995), 225(1-2), 41-4

CODEN: JALCEU; ISSN: 0925-8388
DT Journal
LA English
AB Excitation processes of rare-earth (RE) ions are discussed. These involve RE ionization (impact ionization), carrier trapping, and finally exciton binding. Previous ESR studies of **ZnS:Eu** and new results of optically detected cyclotron resonance studies of InP:Yb indicate rather small carrier trapping rates by RE ions. The nonradiative recombination transitions of RE ions are also described.

L45 ANSWER 14 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:89841 HCAPLUS
DN 120:89841
TI Efficiency enhancement for ZnS blue light-emitting luminophors
AU Vygonyails, O. M.; Guretskaya, Z. I.; Galaktionov, S. S.
CS Mosk. Khim.-Tekhnol. Inst., Moscow, Russia
SO Neorg. Mater. (1993), 29(10), 1356-7
CODEN: NMATEI
DT Journal
LA Russian
AB The effect was studied of small addns. of Eu on the properties of ZnS in connection with its proposed use in projection color TV and the development of other electron-beam devices. The synthesis was conducted at 1050.degree. under a layer of C. Elemental S was used as the sulfidation agent. The concn. of Eu was varied from 0.002 to 0.06 wt.%. The effectiveness of the Eu action depends on the nature of the halide used in the synthesis. In the presence of chlorides (NaCl, MgCl2, NH4Cl) the introduction of Eu in small concns. increases the brightness of the luminescence during cathodic excitation by an av. of 10%. In the presence of bromide ions, an increase in the brightness was not obsd.

L45 ANSWER 15 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:527419 HCAPLUS
DN 119:127419
TI On correlation between rare earth ion energy structure and its recombination and excitation mechanism in semiconductor
AU Swiatek, K.; Suchocki, A.; Godlewski, M.
CS Inst. Phys., Pol. Acad. Sci., Warsaw, Pol.
SO Int. Sch. Excited States Transition Elem., 2nd (1992), Meeting Date 1991, 421-4. Editor(s): Strek, W. Publisher: World Sci., Singapore, Singapore.
CODEN: 59EKA8
DT Conference
LA English
AB An efficient mechanism of rare earth (RE) intra-ion excitation, due to nonradiative bound exciton recombination, is discussed. Some RE ions, mostly those which can change their charge state, bind excitons. These bound excitons may recombine nonradiatively due to the impurity Auger effect, i.e., energy transfer to core states, which results in core excitation, followed by an intra-ion emission. The correlation between the energy structure of an RE-bound exciton system and the recombination mechanism is discussed on the example of Eu impurity in ZnS and CaS crystals.

L45 ANSWER 16 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:48868 HCAPLUS
DN 118:48868
TI Electroluminescent characteristics of europium-**doped** yttrium oxide sulfide (Y2O2S): thin films deposited by reactive magnetron sputtering

AU Sowa, K.; Tanabe, M.; Furukawa, S.; Nakanishi, Y.; Hatanaka, Y.
CS Dep. Electron., Nippondenso Tech. Coll., Anjo, 446, Japan
SO Electroluminescence, Proc. Int. Workshop 6th (1992), 315-19
CODEN: 58ONAQ
DT Conference
LA English
AB Hot carrier injection (HCI) type electroluminescent devices with Y2O2S:Eu/ZnS/Y2O2S:Eu structure were fabricated by using the reactive magnetron sputtering and the electron beam deposition systems. Red light emission from Eu3+ ions was studied for different deposition and heat treatments.

L45 ANSWER 17 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:48398 HCAPLUS
DN 118:48398
TI Luminescence decay and efficiency of the europium(2+) emission in strontium sulfide
AU Huettl, B.; Mueller, G. O.; Mach, R.; Fouassier, C.; Kreissl, J.; Benalloul, P.; Xian, H.; Barthou, C.
CS Lab. Electrolumin., Heinrich-Hertz-Inst., Berlin, O-1086, Germany
SO Electroluminescence, Proc. Int. Workshop 6th (1992), 123-7
CODEN: 58ONAQ
DT Conference
LA English
AB The radiative decay times of Eu2+ in SrS with and without Cl coding were detd. Over some orders of magnitude in the Eu concn. the luminescence efficiency approaches unity at .apprx.140 K. Nonlinear losses, very pronounced in ZnS:Mn, are not dominant in this system. Room temp. behavior is complex, and strongly influenced by after-glow. The latter is enhanced very much by Cl incorporated during prepn. A consistent picture of the concn. quenching can only be given after some improvements in prepn. techniques.

L45 ANSWER 18 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:13503 HCAPLUS
DN 118:13503
TI Characteristics of **europium-doped** yttrium sesquioxide/**zinc sulfide**/Y2O3:Eu red light emitting electroluminescent devices
AU Sowa, Kunihiro; Tanabe, Masami; Furukama, Seigo; Nakanishi, Yoichiro; Hatanaka, Yoshinori
CS Dep. Electron., Nippondenso Tech. Coll., Takatana, 446, Japan
SO Jpn. J. Appl. Phys., Part 1 (1992), 31(11), 3598-602
CODEN: JAPNDE; ISSN: 0021-4922
DT Journal
LA English
AB Hot-carrier-injection-type electroluminescent (HCI-EL) devices of Y2O3:Eu/ZnS/Y2O3:Eu structure were fabricated by the electron beam deposition technique and red light emission of about 10 cd/m2 intensity was obsd. from Eu3+ ions. Brightness at relatively high applied voltage was proportional to the applied frequency, as has been reported, while it was decreased above several hundred Hz at relatively low applied voltage. It is considered that the resistance part of the Y2O3:Eu layer becomes dominant at relatively low applied voltage and the capacitance part becomes dominant at higher applied voltage. Red light emission from Eu3+ ions was obsd. for both half cycles of bipolar square wave applied to the Y2O3:Eu/ZnS/Y2O3-structure EL device, of which only one side of Y2O3 layers was **doped** with Eu. It is considered that light emission may occur by impact ionization of holes generated in the ZnS layer.

L45 ANSWER 19 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:417897 HCAPLUS
DN 115:17897
TI On the nature of europium-related emissions in zinc sulfide and calcium sulfide
AU Swiatek, K.; Godlewski, M.; Niinisto, L.; Leskela, M.
CS Inst. Phys., Pol. Acad. Sci., Warsaw, 02-668, Pol.
SO Acta Phys. Pol., A (1991), 79(2-3), 255-7
CODEN: ATPLB6; ISSN: 0587-4246
DT Journal
LA English
AB The Eu-connected recombination process in ZnS and CaS are analyzed on the basis of optical studies. A new Eu-related emission in ZnS is attributed to the recombination of an exciton bound at the Eu2+ center, while in CaS the emission is dominated by the direct Eu2+ intra-ion transition.

L45 ANSWER 20 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:72012 HCAPLUS
DN 114:72012
TI Low-voltage driven zinc sulfide:manganese MIS and MISIM thin-film electroluminescent devices with europium oxide (Eu2O3) insulator layer
AU Jayaraj, M. K.; Vallabhan, C. P. G.
CS Dep. Phys., Cochin Univ. Sci. Technol., Cochin, 682 022, India
SO J. Phys. D: Appl. Phys. (1990), 23(12), 1706-10
CODEN: JPAPBE; ISSN: 0022-3727
DT Journal
LA English
AB AC thin film electroluminescence devices of MIS and MISIM were fabricated with a novel dielec. layer of Eu2O3 as an insulator. The threshold voltage for light emission depends strongly on the frequency of excitation source in these devices. These devices are fabricated with an active layer of ZnS:Mn and a novel dielec. layer of Eu2O3 as an insulator. The obsd. frequency dependence of brightness-voltage characteristics is explained on the basis of the loss characteristic of the insulator layer. Changes in the threshold voltage and brightness with variation in emitting or insulating film thickness were investigated in metal-insulator-semiconductor (MIS) structures. The decrease in brightness occurring with decreasing ZnS layer thickness can be compensated by an increase in brightness obtained by reducing the insulator thickness. The optimal condition for low threshold voltage and higher stability occurs when the active layer to insulator thickness ratio lies between one and two.

L45 ANSWER 21 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:32264 HCAPLUS
DN 114:32264
TI Erbium(3+) concentration induced change in electroluminescence excitation mechanism in zinc cadmium sulfide phosphors
AU Patil, P. K.; Nandgave, J. K.; Lawangar-Pawar, R. D.
CS Dep. Phys., New Coll., Kolhapur, 416002, India
SO Solid State Commun. (1990), 76(5), 571-4
CODEN: SSCOA4; ISSN: 0038-1098
DT Journal
LA English
AB (Zn0.4Cd0.6)S phosphors **doped** with varying concns. of Er3+ were prepd. under the inert atm. of Ar and the dependence of their EL (electroluminescence) brightness on voltage was investigated. The El brightness is an increasing function of applied a.c. voltage obeying the power law relation of B = AVn up to a certain concn. of Er3+ and the

Alfrey-Taylor relation B = B0 exp(-b/.sqroot..hivin.V) beyond that. The change in EL excitation mechanism with Er3+ concn. is explained on the basis of change in the no. and effectiveness of Mott-Schottky type exhaustion barriers in the no. and effectiveness of Mott-Schottky type exhaustion barriers in the phosphors. An attempt was made to correlate the result with microstructure and elec. characteristics of the phosphors.

L45 ANSWER 22 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:541342 HCAPLUS
DN 113:141342
TI Deep europium-bound exciton in a zinc sulfide lattice
AU Swiatek, K.; Godlewski, M.; Hommel, D.
CS Inst. Phys., Pol. Acad. Sci., Warsaw, PL-02-668, Pol.
SO Phys. Rev. B: Condens. Matter (1990), 42(6), 3628-33
CODEN: PRBMDO; ISSN: 0163-1829
DT Journal
LA English
AB Eu-related recombination processes in ZnS are discussed on the basis of ESR and optical studies. The absence of any Eu2+ and/or Eu3+ intraion emissions is explained as a consequence of the midgap position of Eu2+ in ZnS. A new Eu-related IR emission was obsd. and attributed to a bound-exciton (BE) recombination. In the Eu-bound exciton, the hole is strongly localized on the 4f shell of Eu, whereas the electron is either delocalized on the 12 nearest-neighbor Zn-cation sites (for isolated Eu) or trapped at a compensating ion (for Eu complexes). The BE dissocn. energy is .apprx.10 meV.

L45 ANSWER 23 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1987:523674 HCAPLUS
DN 107:123674
TI Interaction between copper and europium in zinc sulfide
AU Arkhangel'skii, G. E.; Bukke, E. E.; Grigor'ev, N. N.; Lavrov, A. V.; Fok, M. V.
CS USSR
SO Zh. Prikl. Spektrosk. (1987), 47(1), 49-54
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
AB The intensity of luminescence and EPR of **ZnS**:**Eu**,Cu decreases sharply with the content of Cu introduced both in the course of synthesis and during electrolytic activation. Such a change of properties is explained by the formation of Eu-Cu complexes decreasing the concn. of single impurity ions and serving as the killer.

L45 ANSWER 24 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:571802 HCAPLUS
DN 97:171802
TI New type of thin-film electroluminescent device having a multilayer structure
AU Suyama, Takahiro; Okamoto, Kenji; Hamakawa, Yoshihiro
CS Fac. Eng. Sci., Osaka Univ., Osaka, 560, Japan
SO Appl. Phys. Lett. (1982), 41(5), 462-4
CODEN: APPLAB; ISSN: 0003-6951
DT Journal
LA English
AB A new kind of multilayered thin-film electroluminescent (EL) device is discussed. The device consists of multiple alternate layers in which the functions of carrier acceleration and light emission are sepd. One big advantage of the proposed structure is that the light emitting phosphor

can be selected independently of the carrier accelerating material, thus permitting a variety of color emissions. Therefore, one can optimize the device performance by selecting combinations of materials and cell structure design parameters. For example, a device employing ZnS and Y2O3:Eu thin films as the carrier accelerator and light emitter, resp., emits a red color, and a brightness level of 40-ft lambert was obtained under sinusoidal voltage excitation of 5 kHz. This value is several times higher than that reported for powd. layers of Y2O3:Eu.

L45 ANSWER 25 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:414371 HCAPLUS
DN 97:14371
TI Nontrivial kinetics of the polarization of luminescence in **europium-doped zinc sulfide** crystals
AU Grigor'ev, N. N.; Ovchinnikov, A. V.; Fok, M. V.
CS USSR
SO Kratk. Soobshch. Fiz. (1982), (8), 25-30
CODEN: KRSFAU; ISSN: 0455-0595
DT Journal
LA Russian
AB The degree of luminescence polarization of recombination centers was found in single crystals of **ZnS**:**Eu** in the afterglow process.

L45 ANSWER 26 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:207760 HCAPLUS
DN 96:207760
TI Generalization of the prebreakdown electroluminescence theory in the case of very weak and very strong fields
AU Fok, M. V.; L'vova, E. Yu.; Botoev, A. N.
CS Fiz. Inst. im. Lebedeva, Moscow, USSR
SO Izv. Akad. Nauk SSSR, Ser. Fiz. (1982), 46(2), 249-52
CODEN: IANFAY; ISSN: 0367-6765
DT Journal
LA Russian
AB The theory of the prebreakdown electroluminescence of crystals was extended to provide for the limiting cores of too high (.apprx.106 Vcm-1) and too low (.apprx.104 Vcm-1) elec. fields. Good agreement with exptl. data was found for the temp. dependence of the crit. energy of electrons required for initiation of luminescence of **ZnS**-Cu crystals **doped** with **Eu**, Pb, Sm, and Tm.

L45 ANSWER 27 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:132605 HCAPLUS
DN 96:132605
TI Temperature dependence of volumetric electroluminescence intensity of **zinc sulfide**-copper crystals **doped** with samarium, **europium**, lead, or thulium
AU Botoev, A. N.; Dem'yanov, V. V.; L'vova, E. Yu.; Timofeev, Yu. P.; Fok, M. V.
CS USSR
SO Zh. Prikl. Spektrosk. (1982), 36(2), 242-5
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
AB The current-brightness characteristics of vol. luminescence of **ZnS** -Cu crystals **doped** with Sm, **Eu** and Pb sloped more with increasing temp., whereas for the Tm-**doped** ZnS-Cu, it rises more steeply. In every case this can be explained by the change of ionization rate with temp. on the basis of the earlier developed theory provided that

the differences in numerical values of some parameters of these crystals are taken into account.

L45 ANSWER 28 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:629225 HCAPLUS
DN 95:229225
TI Rare earth complex **dopants** in ac thin-film electroluminescent cells
AU Benoit, J.; Benalloul, P.; Blanzat, B.
CS Lab. Luminescence, Univ. P. et M. Curie, Paris, 75230, Fr.
SO J. Lumin. (1981), 23(1-2), 175-90
CODEN: JLUMA8; ISSN: 0022-2313
DT Journal
LA English
AB Comparative studies between the different **dopants** used in thin-film a.c. electroluminescent devices as Mn2+ ion leading to high luminosity and long-lived devices, the use of trivalent rare earth ions (Ln3+) and rare earth fluoride centers LnF3 are presented. Rare earth oxysulfides Y2O2S(Ln) and La2O2S(Ln) were introduced as complex centers in the ZnS matrix by sputtering methods. Using the following trivalent ions: Tm3+, Tb3+, Eu3+ some devices emitting resp. the 3 basic colors (blue, green, red) were realized.

L49 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:467976 HCAPLUS
DN 135:38255
TI Flat x-ray detector with an alkali halide scintillator
IN Boerner, Herbert; Nikol, Hans; Wieczorek, Herfried
PA Philips Corporate Intellectual Property G.m.b.H., Germany
SO Ger. Offen., 4 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 19961673	A1	20010628	DE 1999-19961673	19991221
EP 1111405	A2	20010627	EP 2000-204472	20001212
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 2001006214	A1	20010705	US 2000-741923	20001220
JP 2001228254	A2	20010824	JP 2000-387531	20001220
PRAI DE 1999-19961673	A	19991221		

AB This x-ray detector has a **doped** alkali halide scintillator, which has an emission max. at 400 - 440 **nm**, and uses an extended range of x-rays for image anal. The scintillator is viewed by a semiconductor photodiode array, which contains amorphous silica, through a color transducer with a green photoluminescent **phosphor**.

L49 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:778479 HCAPLUS
DN 132:42313
TI High-luminance blue-emitting BaAl2S4:Eu thin-film electroluminescent devices
AU Miura, Noboru; Kawanishi, Mitsuhiro; Matsumoto, Hironaga; Nakano, Ryotaro
CS Department of Electronics and Communications, School of Science and Technology, Meiji University, Kanagawa, 214-8571, Japan
SO Japanese Journal of Applied Physics, Part 2: Letters (1999), 38(11B), L1291-L1292
CODEN: JAPLD8; ISSN: 0021-4922
PB Japanese Journal of Applied Physics
DT Journal
LA English
AB The high-luminance blue emitting electroluminescent (EL) devices which were satisfied with the requirement for full color displays were obtained. BaAl2S4:Eu thin-film EL devices as the new blue emitting EL **phosphor** was prepd. by the two targets pulse-electron-beam evapn. The max. luminance level was 65 cd/m2 under the 50 Hz-pulse voltage. The EL spectrum had a blue emission band with a peak around 475 **nm** due to the 5d-4f transition for Eu2+ ion. The Commission Internationale de l'Eclairage (CIE) color coordinates of BaAl2S4:Eu EL device were x = 0.12 and y = 0.10.
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:412407 HCAPLUS
DN 129:208716
TI Prospects for dense, infrared emitting scintillators
AU Moses, W. W.; Weber, M. J.; Derenzo, S. E.; Perry, D.; Berdahl, P.;

Boatner, L. A.
CS Lawrence Berkeley National Laboratory, University of California, Berkeley, CA, 94720, USA
SO IEEE Trans. Nucl. Sci. (1998), 45(3, Pt. 1), 462-466
CODEN: IETNAE; ISSN: 0018-9499
PB Institute of Electrical and Electronics Engineers
DT Journal
LA English
AB The authors present results from an ongoing search for inorg. scintillators for x- and gamma- ray detection. The authors measure the scintillation properties (luminous efficiency, decay time, and emission wavelength) of powd. samples excited by brief x-ray pulses. To find scintillators that are compatible with Si photodetectors, the authors have tested over 1,100 samples using a photomultiplier tube with a GaAs:Cs photocathode, which is sensitive to 200-950 **nm** emissions. Optical filters are used to block emissions that are observable with bialkali PMTs. Several lanthanide and transition metal ions, mol. complexes, and II-VI compds. are known to have strong emissions at wavelengths >500 **nm**. Several compds. exhibit emission intensities comparable to com. **phosphors** in the 600-900 **nm** range, including Eu and Sm **doped** LuPO4, ScPO4, and YPO4. Significant emissions are also obsd. from Tb, Dy, Er, Pr, and Tm **doped** phosphates, as well as several intrinsic compds., notably Hg2Cl2. Scintillation characteristics of promising compds. (in powd. or small crystal form) are presented.

L49 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1985:624496 HCAPLUS
DN 103:224496
TI Radiation image transfer screen
PA Konishiroku Photo Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60035300	A2	19850223	JP 1983-133768	19830722
	JP 05050719	B4	19930729		

AB Radiation image transfer panel comprising .gtoreq.2 stimulative **phosphors** having different radiation energy dependence of stimulation emission rate is irradiated to transfer the radiation energy to simulation light and to reproduce the image. Various information is given only by irradiating once. The method decreases the exposure of the sample. Thus, a dispersion of 1:3 mixt. of 3Ba3(PO4)2-BaCl2:Eu (.lambda.max 450 **nm**) and Ca3(PO4)2-CaCl2:Cl (.lambda.max 390 **nm**) and poly(vinyl butyral) was homogeneously coated on a poly(ethylene terephthalate) substrate and dried to give a **phosphor** panel. The panel was x-ray irradiated to 10 mR through an object comprising Cu and poly(Me methacrylate) (I) to form a latent image. The **phosphor** panel was excited with Ar laser and the stimulated emission was simultaneously detd. using an S-5 photomultiplier and interference filter having transmission range at 450 **nm** and an S-5 photomultiplier and another interference filter having transmission range 350 **nm** to give 2 different images. An image of I without Cu was obtained by subtraction.

L54 ANSWER 1 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:618500 HCAPLUS
DN 133:303431
TI Development of full-color display combined with ultraviolet-electroluminescence/photoluminescence multilayered thin films
AU Senda, Takahiro; Cho, Young-Jae; Hirakawa, Takashi; Okamoto, Hiroaki; Takakura, Hideyuki; Hamakawa, Yoshihiro
CS Faculty of Science and Engineering, Ritsumeikan University, Kusatsu, Japan
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (2000), 39(8), 4716-4720
CODEN: JAPNDE; ISSN: 0021-4922
PB Japan Society of Applied Physics
DT Journal
LA English
AB A series of systematic investigations have been carried out on a new type of full-color display devices combining UV (UV) thin film electroluminescence (EL) with red, green and blue (RGB) visible-light **phosphors**. The device structure is composed of **phosphor** /Indium Tin Oxide (ITO)/a-SiNx/ZnF2:Gd/a-SiNx/Al/glass. UV emission from a ZnF2:Gd active layer is employed as an excitation source for the **phosphors**. For the UV-EL/photoluminescence (PL) hybrid device using blue light-emitting **phosphors**, a max. luminance of 10 cd/m2 and a max. efficiency of 0.0151 m/W has been achieved while the luminance of red and green light-emitting devices were 50 and 30 cd/m2, resp., under an applied voltage of 250 V0-p (5 kHz sinusoidal voltage). Tech. data on the fabrication of the thin film UV-EL device together with RGB visible-light PL layers are presented. Research and development efforts on the optimum design and optoelectronic performance and related characterizations are also described and discussed. It is believed that there will be a tremendous demand for the developed device which has a much higher picture element resoln. and the possibility of a higher brightness as compared with recently introduced plasma display panels (PDPs).
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:135845 HCAPLUS
DN 128:210953
TI Back light for color liquid-crystal display
IN Yaniv, Zvi; Kumar, Nalin
PA SI Diamond Technology, Inc., USA
SO PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9807066	A1	19980219	WO 1997-US14429	19970815
	W: CA, CN, JP, KR				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	US 5926239	A	19990720	US 1996-755168	19961122
	WO 9822849	A1	19980528	WO 1997-US21452	19971121
	W: CA, CN, JP, KR				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	JP 11007016	A2	19990112	JP 1997-362450	19971121

PRAI US 1996-699119 19960816
US 1996-755168 19961122
AB A back light for a color liq.-crystal display uses various techniques for activating colored **phosphors** which emit colored light to each one of several sub-pixels within a particular liq.-crystal display pixel. Activation of the colored **phosphors** may be performed using field emission devices, both diode and triode, a fluorescent lamp, or a high-intensity glow discharge lamp.

L54 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:687016 HCAPLUS
DN 127:301089
TI Thin-film electroluminescent devices with **phosphor** layers including a Group IIIA metal-contg. overlayer
IN Sun, Sey-Shing; Bowen, Michael S.
PA USA
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5677594	A	19971014	US 1995-509745	19950801

AB A.c. thin-film electroluminescent devices which comprise an electroluminescent **phosphor**; a pair of insulating layers sandwiching said electroluminescent **phosphor**; and a pair of electrode layers sandwiching said pair of insulating layers are described in which the electroluminescent **phosphor** comprises: a first **phosphor** layer selected from the group consisting of an alk. earth sulfide, an alk. earth selenide, and an alk. earth sulfide selenide, and further including an activator **dopant**; and an overlayer deposited atop the first **phosphor** layer, said overlayer including a Group 3A metal selected aluminum, gallium, and indium. The Group IIIA element may be incorporated within a related **phosphor** host compd. (e.g., the overlayer for SrS **phosphors** may be Ca0.5Sr0.5Ga2S4).

L54 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:679284 HCAPLUS
DN 127:339317
TI Excitation of emissive display device
IN Crossland, William Alden; Davey, Anthony Bernard; Geake, Vincent Glenn; Springle, Ian David; Cash, Lee Stephen; Bayley, Paul Andrew
PA Screen Technology Ltd., UK; Crossland, William Alden; Davey, Anthony Bernard; Geake, Vincent Glenn; Springle, Ian David; Cash, Lee Stephen; Bayley, Paul Andrew
SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9737271	A1	19971009	WO 1997-GB878	19970327

PI
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ,

BY, KG, KZ, MD, RU, TJ, TM
RW: GH, KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

	AU 9721713	A1	19971022	AU 1997-21713	19970327
PRAI	GB 1996-6659		19960329		
	WO 1997-GB878		19970327		

AB A liq.-crystal display device comprises a light source producing activating light, a light-modulating layer such as a liq. crystal layer for modulating the light from the source, and an output means such as **phosphor** dots responsive to the activating light that passes through the modulator. In order to reduce the damage that tends to be done to the fabric of the display by the UV light used in earlier designs of display devices and to broaden the applicability of available optical materials and components, the light source in the present invention emits at visible wavelengths. Suitable **phosphors** are disclosed.

L54 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:541890 HCAPLUS
DN 127:168841
TI Oxygen-**doped** thiogallate **phosphor**
IN Sun, Sey-shing; Dickey, Eric R.; Tuenge, Richard T.; Wentross, Randall
PA USA
SO U.S., 6 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5656888	A	19970812	US 1995-555644	19951113

AB Thin film electroluminescent (TFEL) structure comprising first and second electrode layers sandwiching a TFEL stack are described in which the stack includes first and second insulator layers and a **phosphor** layer comprising an alk. earth thiogallate **doped** with oxygen. The stack may further include zinc, and/or a zinc sulfide layer may be provided along with the thiogallate **phosphor** layer.

L54 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:527286 HCAPLUS
DN 125:181489
TI Method of manufacturing display screen
IN Itou, Takeo; Matsuda, Hidemi; Chigusa, Hisashi; Sakai, Kazuo; Fukuda, Masaru
PA Kabushiki Kaisha Toshiba, Japan; Fuji Pigment Co., Ltd.
SO Eur. Pat. Appl., 39 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 718866	A2	19960626	EP 1995-119570	19951212
	EP 718866	A3	19970502		
	EP 718866	B1	19990331		
	R: DE, FR, GB				
	JP 08171855	A2	19960702	JP 1994-315058	19941219
	JP 08171854	A2	19960702	JP 1994-315059	19941219
	CN 1132923	A	19961009	CN 1995-120902	19951219

	US 5885752	A	19990323	US 1995-574978	19951219
PRAI	JP 1994-315058		19941219		
	JP 1994-315059		19941219		

AB A soln. of the salt of a polymer electrolyte is used as a dispersant in the dispersion soln. contg. a pigment and used for forming the first layer of the display screen and the substance which forms a salt along with the polymer electrolyte is mixed into the soln. and applied to the pigment layer to form the second layer. The formed layers are patterned and thus a display screen is obtained.

L54 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:284577 HCAPLUS
DN 124:301976
TI Electroluminescent displays with blue/green emitters, methods for their fabrication, and apparatus for carrying out the methods
IN Mauch, Reiner H.; Velthaus, Karl-Otto
PA Heinrich-Hertz-Institut Fuer Nachrichtentechnik Berlin GmbH, Germany
SO Ger. Offen., 8 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 4435016	A1	19960328	DE 1994-4435016	19940923
	WO 9609354	A1	19960328	WO 1995-DE1344	19950922
	W: AU, CA, CN, FI, JP, KR, RU, UA, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9535612	A1	19960409	AU 1995-35612	19950922
PRAI	DE 1994-4435016		19940923		
	WO 1995-DE1344		19950922		

AB Thin-film electroluminescent displays using multilayered emitting structures to produce white light emission are described which employ as a blue/green emitter a materials comprising an alk. earth compd. host crystal **doped** with a rare earth and .gtoreq.1 Group IIB and/or Group VIIB metal and which are constructed so that >4000 cd/m2 white light is emitted at an excitation frequency of 1 kHz with an efficiency of >1 lm/W. Methods for fabricating the displays include the growth of the blue/green emitter layer in the presence of he Group IIB and/or Group VIIB metals or their chalcogenides. App. for carrying out the methods includes sources (e.g., selectively heatable effusion cells) for the blue/green layer precursors.

L54 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:605592 HCAPLUS
DN 122:325979
TI Field-emission electroluminescent laser devices
IN Hori, Yoshikazu; Ban, Juzaburo
PA Matsushita Electric Ind Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07038192	A2	19950207	JP 1993-176464	19930716

AB The devices comprise: a Si substrate with an alternating getter/emitter field-emission array; a vacuum spacing; and a laminate of an aluminum, a

silica, an active, and a quartz layer, wherein the active layer emitting a UV-visible laser beam comprises an electroluminescent **phosphor** dispersed in a glass.

L54 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:478195 HCAPLUS
DN 122:226363
TI Light sources in electrophotography
IN Kido, Fusakichi; Matsuda, Naohisa
PA Tokyo Shibaura Electric Co, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06262804	A2	19940920	JP 1993-51081	19930311

AB The light sources comprise a thin-film electroluminescent element contg. a ZnS, a CaS or a SrS **phosphor doped** with Ce, Yb, Sm, Eu, Dy, Ho, and/or Pr.

L54 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:469679 HCAPLUS
DN 121:69679
TI Direct current electroluminescent element for display
IN Kobayashi, Shiro; Enjoji, Katsuhisa; Fujasu, Hiroshi
PA Nippon Sheet Glass Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05211093	A2	19930820	JP 1991-67852	19910307

AB The title element is made by forming in order on a transparent insulative substrate a transparent electrode, a light-emitting layer in which a fine elec. conductive powder is fixed by a binder, an elec. current-restraining layer, and a back electrode; the light-emitting layer is a laminate comprising .gtoreq.2 layers in which 2 kinds of **phosphor** layers of which one has a higher energy band gap than the other are laminated alternately to form quantum well; and the forbidden band of the **phosphor** layer having a higher energy band gap contains an impurity which generates excited level of electrons. The electroluminescent element emits blue light or white light with high efficiency.

L54 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:222995 HCAPLUS
DN 118:222995
TI Color display device having liquid crystal cell and fluorescent display with two different luminous sections
IN Watanabe, Hiroshi; Ikuta, Youichi
PA Futaba Denshi Kogyo K.K., Japan
SO U.S., 12 pp. Cont. of U.S. Ser. No. 269,722, abandoned.
CODEN: USXXAM
DT Patent
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5142388	A	19920825	US 1991-811871	19911220
PRAI	JP 1987-282066		19871110		
	JP 1987-284573		19871111		
	US 1988-269722		19881110		

AB A color display device, which emits 3 primary colors of equalized luminance, so that a high-quality color display free of unevenness may be accomplished, comprises a liq. crystal cell and a fluorescent display section including 1st and 2nd luminous sections different in luminous characteristics and combined with an optical rotation section and color polarizing plates. The fluorescent display section and the optical rotation section are synchronously driven.

L54 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:135683 HCAPLUS
DN 118:135683
TI A method of making a single-layer multicolor luminescent display
IN Robertson, James B.
PA United States National Aeronautics and Space Administration, USA
SO U. S. Pat. Appl., 14 pp. Avail. NTIS Order No. PAT-APPL-7-858,176.
CODEN: XAXXAV
DT Patent
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 858176	A0	19921215	US 1992-858176	19920324
	US 5194290	A	19930316		
	US 5047686	A	19910910	US 1987-140185	19871231
	US 4987339	A	19910122	US 1989-338379	19890413
	US 5104683	A	19920414	US 1991-693049	19910430
PRAI	US 1987-140185		19871231		
	US 1989-337768		19890413		
	US 1991-693049		19910430		

AB Arrays of differently colored **phosphors** suitable for luminescent displays are formed by selectively **doping** (e.g., using ion implantation or thermal diffusion) a layer of a host material (e.g., ZnS) using a appropriately positioned mask(s) while leaving the top surface of the host material layer smooth.

L54 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:244771 HCAPLUS
DN 116:244771
TI High luminance white EL devices using cerium, europium, potassium-**doped** strontium sulfide films deposited in a hydrogen atmosphere
AU Gao, Q. Z.; Mita, J.; Tsuruoka, T.
CS Res. Lab., OKI Electr. Ind. Co., Ltd., Hachioji, 193, Japan
SO J. Cryst. Growth (1992), 117(1-4), 983-6
CODEN: JCRGAE; ISSN: 0022-0248
DT Journal
LA English
AB White electroluminescence (EL) devices were fabricated using SrS:Ce, Eu, K **phosphor** films deposited in a reducing atm. of H2. The highest luminance of 1700 cd/m2 was obtained under 1 kHz sinusoidal voltage drive. This value is 2.3 times larger than that of the devices fabricated without an atm. of H2. Compared to **phosphor** films prepd. without an atm. of H2 gas, the residual oxygen concn. in the films decreased by one

half, addnl., the x-ray diffraction pattern showed a preferential (200) orientation.

L54 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:184451 HCAPLUS
DN 116:184451
TI Development/study of thin films for electroluminescent flat panel display
AU Natarajan, P. V.; Vaiude, D. G.; Rao, B. M.
CS Dep. Hybrid Microelectron., Hind. Aeronaut. Ltd., Hyderabad, India
SO Hybrid Circuits (1992), 27, 28-32
CODEN: HYCRD5; ISSN: 0265-3028
DT Journal
LA English
AB In ACTFEL (a.c. thin film electroluminescent flat panel) device, an active layer, **doped** with manganese (ZnS:Mn) is sandwiched between the 2 dielec. layers followed by conductive layers. All the layers are transparent except the back conductive layer. In the basic mode of operation, an alternating voltage is applied across any 2 crossing electrodes. When this voltage exceeds the threshold voltage, light is emitted from the active layer. EL mechanism (the generation of electrons, acceleration of these electrons to optical energies, and collision excitation of the Mn ions yielding light emission) occurs within the film or at the surface of the ZnS:Mn layer. A bright yellow light, in the visible region and with a relatively broad spectrum, is emitted. The TFEL display's thinness, compactness, low wt., moderately low power requirements and durability are its prime advantages. The characteristics of various thin films utilized in TFEL were studied. The optimum requirements for luminance, efficiency and reliability of the light emission in ACTFEL are demonstrated.

L54 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:523913 HCAPLUS
DN 115:123913
TI Photoconductor-field emitter combination type monochromic display devices with memory effect
IN Teawills, Paskal
PA Fr.
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02262186	A2	19901024	JP 1990-28576	19900209
	US 5055739	A	19911008	US 1990-477300	19900208
PRAI	FR 1989-1747		19890210		

AB The title display devices having a substrate, a field emission layer, and a photoconductor layer are characterized in that the photoconductor layer and the emission layer materials are selected so that the overlap between the emission spectrum and sensitivity spectrum as well as the overlap between the emission spectrum and room illumination spectrum are minimal. The emission and illumination spectral overlap may be minimized by using appropriate optical filters.

L54 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:418248 HCAPLUS
DN 115:18248
TI A.C. thin film electroluminescent devices with rare earth **doped**

zinc sulfide
AU Jayaraj, M. K.; Vallabhan, C. P. G.
CS Dep. Phys., Cochin Univ. Sci. Technol., Cochin, 682 022, India
SO J. Electrochem. Soc. (1991), 138(5), 1512-16
CODEN: JESOAN; ISSN: 0013-4651
DT Journal
LA English
AB The fabrication of ZnS:rare earth (RE), Cl thin-film electroluminescent (TFEL) devices and their emission characteristics are described. The various emission bands and lines obsd. in the spectra were assigned to the transitions within the RE3+ ions. The operating voltages are <50 V using devices with metal-insulator-semiconductor structure, with Sm2O3 as the insulator. Studies on the effect of halides (F-, Cl-, Br-) and oxide (O2-) on the EL emission spectra of ZnS:Pr TFEL devices show that the fluoride **dopant** produces the max. brightness. The brightest of the ZnS:RE, Cl devices studied, ZnS:Tb, Cl, has a brightness of .apprx.500 flumen, about one-third that of a typical ZnS:Mn EL cell.

L54 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1987:25571 HCAPLUS
DN 106:25571
TI Recent progress in color-electroluminescence devices
AU Kobayashi, Hiroshi; Tanaka, Shosaku
CS Fac. Eng., Tottori Univ., Totori, 680, Japan
SO Oyo Butsuri (1986), 55(2), 131-4
CODEN: OYBSA9; ISSN: 0369-8009
DT Journal; General Review
LA Japanese
AB The development of electroluminescent (EL) devices for use in panel-type displays is reviewed with 13 refs. Discussions are given of the growth of alk. sulfide films used as basic material and also of the EL characteristics of CaS:Eu (red), CaS:Ce (green) and SrS:Ce (blue) systems. The ZnS-based device and the development of multicolor EL films are also considered.

L54 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:619478 HCAPLUS
DN 101:219478
TI Thin film electroluminescent device
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59146191	A2	19840821	JP 1983-20601	19830210

AB In rare earth-activated ZnS **phosphor** films, an alkali metal is used as a carrier compensation element; the rare earth element used may be .gtoreq.1 element selected from Pr, Sm, Eu, Tb, Dy, Ho, Er, and Tm. The compn. provides high brightness. Thus, an electroluminescent device comprising of (1) a transparent electrode, (2) a Y2O3 layer, (3) a LiTbS2:ZnS **phosphor** layer, (4) another Y2O3 layer and (5) an Al electrode, showed high luminance and a lowering of emission threshold voltage.

L58 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:390633 HCAPLUS
DN 133:20067
TI Kinetics of hydrogen absorption of Al-**doped** MmNi5
AU Fernandez, G. E.; Rodriguez, D.; Meyer, G.
CS Centro Atomico Bariloche, Comision Nacional de Energia Atomica, Bariloche, 8400, Argent.
SO Hydrogen Energy Progress XII, Proceedings of the World Hydrogen Energy Conference, 12th, Buenos Aires, June 21-26, 1998 (1998), Volume 2, 1015-1023. Editor(s): Bolcich, Juan Carlos; Veziroglu, T. Nejat. Publisher: Asociacion Argentina del Hidrogeno, Buenos Aires, Argent. CODEN: 69CKA9
DT Conference
LA English
AB Using recently published models for the formation of metal hydrides with one rate detg. partial reaction step together with absorption kinetics measurements performed on MmNi4.7Al0.3 samples, we identified the limiting process of the reaction. Absorption kinetic was measured at several temps. using the std. Sieverts technique on activated (powd.), surface-treated (Pd-covered) and intentionally oxidized samples and compared to the modeled pressure-time dependence to find the limiting reaction step in each case. For the activated and Pd-covered samples, we find diffusion to be the limiting process during the formation of metal hydride, whereas for the oxidized samples a surface limited partial reaction step seems to better explain the exptl. results. This suggests that surface treatments only improve the kinetics up to a stage in which it is diffusion-limited. The use of the proposed expressions to fit absorption exptl. data showed to be a very useful tool to det. which is the true limiting step in the absorption kinetics of a given system.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:767860 HCAPLUS
DN 130:69948
TI Resistance welding electrodes made of tungsten-molybdenum alloys for spot welding of galvanized steel sheets, and preparation of the electrodes
IN Seto, Hiroyuki
PA Tokyo Tungsten Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10314957	A2	19981202	JP 1997-125550	19970515

AB The electrodes are composed of 5-95 wt.% of W and balance Mo, wherein 0.05-10.0 wt.% of elements selected from La, Ce, Pr, Nd, Pm, Sm, En, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Y are **doped**. The rare earth metals may be **doped** as elements, oxides, nitrides, carbides, and/or borides. Raw material powder mixts. of the metals (compds.) are heated in reductive atm., molded, sintered, and processed to give the electrodes. The electrodes show long life.

L58 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:483514 HCAPLUS

L58 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2002 ACS
AN 1978:435442 HCAPLUS
DN 89:35442
TI Neutron diffraction measurements of the spatial extent of the cerium moment in the Kondo system cerium-**doped** yttrium
AU Edelstein, A. S.; Stassis, C.; Kline, G.; Beaudry, B.; Maglic, R.
CS Univ. Illinois, Chicago, Ill., USA
SO J. Appl. Phys. (1978), 49(3, Pt. 2), 1503-5
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
AB Neutron diffraction measurements made down to 2.2 K on single crystal samples of the Kondo system Y:Ce indicate that the spatial extent of the impurity magnetic moment is the same as that of the Ce3+ ion. The Kondo temp. TK is probably greater than 6 K. The magnitude of the moment deted. by neutron measurements agrees with that obtained from magnetization measurements at 2.2-30 K.

L33 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:274139 HCAPLUS
DN 131:25475
TI Hydrolyzed colloid reaction (HCR) technique for phosphor powder preparation
AU Erdei, S.; Schlecht, R.; Ravichandran, D.
CS Lasergenics Corp., San Jose, CA, 95119, USA
SO Displays (1999), 19(4), 173-178
CODEN: DISPDP; ISSN: 0141-9382
PB Elsevier Science B.V.
DT Journal
LA English
AB Undoped and Eu3+, Ce3+ and Tb3+ -doped YVO4 YPO4, LaPO4 and YVxP1-xO4 were prepd. in H2O by the recently introduced hydrolyzed colloid reaction (HCR) technique working at low temp. (< 100.degree.) and atm. pressure. Two intermediate - partially hydrophobic - complex colloidal mixts. with metastable characteristics can transform into the stable orthovanadate-orthophosphate phase due to intensive hydrolysis. In contrast with the other low temp. reacting processes - like the sol-gel technique, which makes an amorphous structure - the HCR method can produce cryst. structures in nanometer size ranges. The reaction, morphol., incorporation of activators and different luminescent characteristics are surveyed in this letter-type paper selected from the authors' previous results.

L65 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:796095 HCAPLUS
DN 130:102549
TI Design considerations of GaInNAs-GaAs quantum wells: effects of indium and nitrogen mole fractions
AU Kim, Chang-Kyu; Miyamoto, Tomoyuki; Lee, Yong-Hee
CS Department of Physics, Korea Advanced Institute of Science and Technology, Taejon, 373-1, S. Korea
SO Jpn. J. Appl. Phys., Part 1 (1998), 37(11), 5994-5996
CODEN: JAPNDE; ISSN: 0021-4922
PB Japanese Journal of Applied Physics
DT Journal
LA English
AB The influences of In and N compns. on the optical gain characteristics of a GaInNAs-GaAs single quantum well were studied theor. for the 1st time. When compared with GaInAs, GaInNAs shows a higher optical gain and a longer emission wavelength, under the condition of identical strain. For a given operating wavelength, the higher-In GaInNAs quantum well exhibits a larger optical gain and a smaller carrier leakage than the higher-N GaInNAs quantum well. For example, more than a 2-fold improvement in threshold current is expected from the higher-In Ga0.6In0.4No0.01As0.99 quantum well laser than the higher-N Ga0.75In0.25N0.02As0.98 quantum well laser operating at 1.3 .mu.m.

L72 ANSWER 1 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:933486 HCAPLUS
DN 136:158449
TI Ultraviolet pumped tricolor phosphor blend white emitting **LEDs**
AU Kaufmann, U.; Kunzer, M.; Kohler, K.; Obloh, H.; Pletschen, W.; Schlotter, P.; Schmidt, R.; Wagner, J.; Ellens, A.; Rossner, W.; Kobusch, M.
CS Fraunhofer IAF, Freiburg, D-79108, Germany
SO Physica Status Solidi A: Applied Research (2001), 188(1), 143-146
CODEN: PSSABA; ISSN: 0031-8965
PB Wiley-VCH Verlag Berlin GmbH
DT Journal
LA English
AB Near-**UV** and violet emitting AlGaInN single quantum well **LED** structures were grown by MOCVD on sapphire substrates. On-wafer tests before processing gave an output power at 40 mA between 1.4 mW at 380 nm and 6.7 mW at 420 nm. **LED** chips with wavelengths between 380 and 404 nm were selected for manufg. radial **UV** **LEDs** and white emitting **LEDs**. The **UV** to white converters were prepd. from broad band **red**, green and **blue** emitting powder phosphors with individual luminescence peaks near 610, 550 and 460 nm, resp. White luminescence conversion (LUCO) **LEDs** with a warm hue and color temps. in the range 4000-4300 K are demonstrated.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 2 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:164461 HCAPLUS
DN 134:303732
TI GaN and (In,Ga)N quantum dots grown by MBE: from **UV** to **red** **light** emission
AU Grandjean, Nicolas; Damilano, Benjamin; Massies, Jean
CS Centre National de la Recherche Scientifique - Centre de Recherche sur, Valbonne, 06560, Fr.
SO IPAP Conference Series (2000), 1(Proceedings of International Workshop on Nitride Semiconductors, 2000), 397-402
CODEN: ICSPF6
PB Institute of Pure and Applied Physics
DT Journal
LA English
AB Group-III nitride quantum dots (QDs) were grown by mol.-beam epitaxy. GaN/AlN QDs were used as a prototypical system for studying the interplay of the carrier localization and the built-in polarization field. The latter effect pushes the QD photoluminescence (PL) in the **red** range. (In,Ga)N/GaN QDs are fabricated taking advantage of the Stranski-Krastanow growth mode transition. In0.15Ga0.85N/GaN QDs exhibit a superior radiative efficiency compared to low In content (x .ltoreq. 0.1) InxGa1-xN/GaN quantum wells (QWs). However, the optical properties of (In,Ga)N/GaN QWs with an In compn. of 20% are very close to those of In0.15Ga0.85N/GaN QDs. These similarities could be related to strong In compn. fluctuations forming deep potential wells for x .gtoreq. 0.15. **Blue** to **red** PL at room temp. is then obsd. on In0.2Ga0.8N/GaN QWs despite the huge d. of dislocations. 0.4 To 0.6 .mu.m electroluminescence was obtained from (In,Ga)N/GaN-based **light** emitting **diodes**.
RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 3 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:134162 HCAPLUS
DN 134:185775
TI Group III nitride semiconductor **LED**
IN Koike, Masayoshi
PA Toyota Gosei Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001053336	A2	20010223	JP 1999-222018	19990805

AB A white **light** emitting **LED** comprises: a sapphire substrate; an n-AlN buffer layer; an n-GaN contact layer with an n shoulder electrode; an u-GaInN intermediate, an n-GaN cladding, an Al0.1In0.9N-QW **red**-emitting, a Ga0.8In0.2N-QW green-emitting, and a Ga0.95In0.5N-QW **blue**-emitting GaN-barrier MQW active layer; a p-GaN cap, a p-AlGaN cladding and a p-AlGaN contact layer; and a Co/Au planar and a V/Au/Al button p electrode.

L72 ANSWER 4 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:241692 HCAPLUS
DN 132:271502
TI Vertical geometry InGaN **LED**
IN Doverspike, Kathleen Marie; Edmond, John Adam; Kong, Hua-Shuang; Dieringer, Heidi Marie; Slater, David B., Jr.
PA Cree Research, Inc., USA
SO PCT Int. Appl., 23 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000021144	A2	20000413	WO 1999-US21362	19990916
WO 2000021144	A3	20000727		
W: AE, AL, AM, AT, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CZ, CZ, DE, DE, DK, DK, EE, EE, ES, FI, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1116282	A2	20010718	EP 1999-967073	19990916
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRAI US 1998-154363	A1	19980916		
WO 1999-US21362	W	19990916		

AB Vertical geometry **light**-emitting **diodes** capable of emitting **light** in the **red**, green, **blue**, violet and **UV** portions of the electromagnetic spectrum are described which comprise a conductive silicon carbide substrate; an InGaN quantum well; a conductive buffer layer between the substrate and the quantum well; and a resp. undoped gallium nitride layer on each surface of

the quantum well; and ohmic contacts in a vertical geometry orientation. The buffer layer may have a multilayered structure. Displays employing the **diodes** are also described.

=> D BIB AB 5-16

L72 ANSWER 5 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:582698 HCAPLUS
DN 131:191701
TI **Light** emitting **diode** emitting **red**, green and **blue light**
IN Chen, Hsing
PA Taiwan
SO U.S., 9 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5952681	A	19990914	US 1997-977654	19971124

AB Multicolor **light**-emitting **diodes** are described which comprise .gtoreq.3 **light**-emitting **diode** chips on a transparent substrate, each **light** emitting **diode** chip having a P-type electrode; an N-type electrode, and a reflection layer to direct **light** produced by the **light**-emitting **diode** chip in a predetd. direction; and .gtoreq.2 wavelength converting layers (e.g., phosphor layers) located in the predetd. **light** emitting direction of the **light** from at least two of the **light** emitting **diode** chips so that **light** having .gtoreq.3 different colors is emitted from the **LED**. The **light**-emitting chips may be **blue** -emitting or **UV**-emitting chips; filters may be provided after the wavelength converting materials to filter out **light** which is not of the desired color. Application to displays is indicated.
RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 6 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:508977 HCAPLUS
DN 131:220986
TI Characteristics of InGaN-based **UV/blue**/green/amber/ **red light**-emitting **diodes**
AU Mukai, Takashi; Yamada, Motokazu; Nakamura, Shuji
CS Department of Research and Development, Nichia Chemical Industries Ltd., Tokushima, 774-8601, Japan
SO Jpn. J. Appl. Phys., Part 1 (1999), 38(7A), 3976-3981
CODEN: JAPNDE; ISSN: 0021-4922
PB Japanese Journal of Applied Physics
DT Journal
LA English
AB Highly efficient **light**-emitting **diodes** (**LEDs**) emitting **UV**, **blue**, green, amber and **red** **light** were obtained through the use of InGaN active layers instead of GaN active layers. **Red LEDs** with an emission wavelength of 675 nm, whose emission energy was almost equal to the band-gap energy of InN, were fabricated. The dependence of the emission wavelength of the **red LED** on the current (**blue**

shift) is dominated by both the band-filling effect of the localized energy states and the screening effect of the piezoelec. field. In the **red LEDs**, a phase sepn. of the InGaN layer was clearly obsd. in the emission spectra, in which **blue** and **red** emission peaks appeared. In terms of the temp. dependence of the **LEDs**, InGaN **LEDs** are superior to the conventional **red** and amber **LEDs** due to a large band offset between the active and cladding layers. The localized energy states caused by In compn. fluctuation in the InGaN active layer contribute to the high efficiency of the InGaN-based emitting devices, in spite of the large no. of threading dislocations and a large effect of the piezoelec. field. The **blue** and green InGaN-based **LEDs** had the highest external quantum efficiencies of 18% and 20% at low currents of 0.6 mA and 0.1 mA, resp.

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 7 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:353645 HCAPLUS
DN 131:151316
TI White **LED**
AU Bogner, Georg; Debray, Alexandra; Heidel, Guenther; Hoehn, Klaus; Mueller, Ulrich; Schlotter, Peter
CS HL OC VIS E, OSRAM Opto Semiconductor GmbH, Regensburg, Germany
SO Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3621(Light-Emitting Diodes: Research, Manufacturing, and Applications III), 143-150
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB Since several years **light** emitting **diodes** are in use to generate white **light**. Pixels with green, **red** and **blue LED**'s are arranged to get any coordinate in the CIE--diagram with matched current for each **diode**. For instance Siemens Opto Semiconductor now OSRAM Opto Semiconductor offers multi chip **LED**'s (LHGB T676) esp. for the application above. A far better soln. for producing white **light** represents luminescence conversion. The emitted **light** of **blue diodes** is used as a primary source for exciting org. or inorg. fluorescent. By conversion, Stokes Shift, **red**, green, yellow and mixed colored **light** can be generated. After 1st studies of Fraunhofer IAF Freiburg Siemens OS selected in cooperation with OSRAM an esp. qualified converter, a yellow **light** emitting phosphor. This phosphor is used since several years for prodn. of fluorescent lamps and can be produced in high quality. The fluorescent is distinguished by high thermic and chem. resistance. Very good spectral characteristics and quantum efficiency of nearly 100% re typical. By additive mixing of color the yellow radiation of the fluorescent and the incomplete absorbed **blue light** of the **LED** make the assembly of single-chip-white-**LED**'s near the white color point possible. In established technol. Siemens OS developed a casting resin which contains the fluorescent and his prodn. procedure. Patents are taken out. This casting resin can be used in mass prodn. for assembly of SMT-**LED**'s. The start of ramp up was in 6/98. Further activities for development of fluorescent for different tendencies near the white color point. By changing doping material and use of new producing methods a shift to the **red** or green sector of CIE-diagram can be reached. This makes single-chip-white **LED**'s for common illumination possible. Addn. advantages in stability of color and efficiency are to expect by

luminescence of **UV-light** emitting **diodes**.
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 8 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:353632 HCAPLUS
DN 131:150704
TI Progress and status of visible **light**-emitting **diode** technology
AU Kern, R. Scott
CS Optoelectronics Div., Hewlett-Packard Co., San Jose, CA, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3621(Light-Emitting Diodes: Research, Manufacturing, and Applications III), 16-27
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal; General Review
LA English
AB A review with 54 refs. The **light** emitting **diode** (**LED**) is the dominant type of compd. semiconductor device in terms of the epitaxial area of material produced as well as the no. of devices fabricated and sold. Recent breakthroughs resulted in dramatic performance increases for visible **LEDs**. Very high performance devices are com. available using the AlGaInP materials system for **red**, orange and yellow and the InGaN system for green and **blue**. External quantum efficiencies >10 are available for most colors, with >20 having been achieved in **red** to orange. Currently, the luminous performance of **LEDs** exceeds that of traditional incandescent lamps for colors from **red** to green. As a result of these advances, **LEDs** are becoming competitive in applications such as large area signs, traffic signals and automobile lighting. By mixing **red**, **blue** and green **LEDs** or by using phosphor-converted **blue** or **UV** devices, the creation of white **light** can be achieved, opening up addnl. applications. A review of the applications for high-brightness **LED** technol. will also be presented.
RE.CNT 54 THERE ARE 54 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 9 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:353631 HCAPLUS
DN 131:151308
TI InGaN-based **UV/blue**/green/amber **LEDs**
AU Mukai, T.; Yamada, M.; Nakamura, Shuji
CS Dep. Res. Dev., Nichia Chemical Industries, Ltd., Tokushima, Japan
SO Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3621(Light-Emitting Diodes: Research, Manufacturing, and Applications III), 2-13
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB High-efficient **light** emitting **diodes** (**LEDs**) emitting **red**, amber, green, **blue**, and **UV** **light** were obtained through the use of an InGaN active layers instead of GaN active layers. **Red LEDs** with an emission wavelength of 680 nm which emission energy was smaller than the band-gap energy of InN were fabricated mainly resulting from the piezoelec. field due to the strain. The localized energy states caused by In compn. fluctuation in the InGaN active layer seem to be related to the high efficiency of the InGaN-based emitting devices in spite of having a

large no. of threading dislocations. InGaN single-quantum-well- structure **blue LEDs** were grown on epitaxially laterally overgrown GaN and sapphire substrates. The emission spectra showed the similar **blue** shift with increasing forward currents between both **LEDs**. The output power of both **LEDs** was almost the same, .ltoreq.6 mW at a current of 20 mA. The In compn. fluctuation is not caused by dislocations, the dislocations are not effective to reduce the efficiency of the emission, and the dislocations from the leakage current pathway in InGaN.

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 10 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:718774 HCAPLUS
DN 130:58795
TI Using a **light**-emitting **diode** as a high-speed, wavelength selective photodetector
AU Miyazaki, Eiichi; Itami, Shin; Araki, Tsutomu
CS Faculty of Education, Department of Industrial Arts, Kagawa University, Takamatsu, Kagawa, 760-8522, Japan
SO Rev. Sci. Instrum. (1998), 69(11), 3751-3754
CODEN: RSINAK; ISSN: 0034-6748
PB American Institute of Physics
DT Journal
LA English
AB A **light**-emitting **diode** (**LED**) can function as a wavelength selective photodetector. To evaluate the potential for a **LED**-based photodetector, the authors have studied the stationary and temporal characteristics of two kinds of **LEDs**: a Zn-doped InGaN **blue LED** and a GaAlAs **red LED**. The application of a high current produced two peaks on the emission spectra of the **blue LED**, at 380 and 450 nm. The extinction profile of the **blue LED** was consistent with its **UV**-emission profile. The **red LED** showed an emission peak at 660 nm and an extinction peak at 620 nm. The **LED**-based photodetector responded within nanoseconds of the onset of the **light** impulse. The application of a reverse bias to the **LED** caused the time spread of the output current wave form to decrease dramatically and was accompanied by an increase in peak height. At a 75 V reverse bias, the resultant pulse widths were 2.6 ns in the **blue LED** and 7.4 ns in **red LED**.

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L72 ANSWER 11 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:328923 HCAPLUS
DN 129:101662
TI Fabrication and characterization of GaN-based **blue** lighting-emitting **diodes**
AU Li, Y.; Brown, M. G.; Eliashevich, I.; Dicarlo, T.; Tran, C.; Karlicek, R. F., Jr.; Stall, R. A.; Koszi, L. A.; Lu, Y.; Shen, H.
CS EMCORE Corporation, Somerset, NJ, 08873, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1998), 3279(Light-Emitting Diodes: Research, Manufacturing, and Applications II), 2-7
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB GaN homojunction and InGaN/GaN single quantum well (SQW) **light**

-emitting **diodes** (**LEDs**) were fabricated and characterized. The **blue LED** has a typical operating voltage of 3.6 V at 20 mA. Temp. dependence of the emission characteristics of the GaN-based **LEDs** was studied from 25.degree. to 130.degree.. The emission intensity of the InGaN/GaN SQW **LED** decays exponentially with the increase of temp. The temp. coeff. Lc is 2.5 .times. 10-2 /.degree.C. The emission wavelength of the InGaN/GaN SQW **LED** is relatively independent of the **LED** operation temp. while the **UV** emission of the GaN homojunction **LED** has a **red** shift with the increase of temp. The temp. coeff. .alpha. of the bandgap energy of Si-doped n-type GaN derived from the EL measurement is 8.5 .times. 10-4/K. The low temp. coeff. of emission wavelength of the InGaN/GaN SQW **LED** indicates that the recombination processes involves localized states. The localized states are attributed to excitons localized at the potential min. in the quantum well due to In content fluctuation.

L72 ANSWER 12 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:467681 HCAPLUS
DN 127:88165
TI Group III nitride semiconductor display devices
IN Sasa, Michinari; Koike, Masayoshi; Asami, Shinya
PA Toyoda Gosei Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09153644	A2	19970610	JP 1995-338116	19951130

AB The devices comprise a **UV**-emitting monolithic **LED** dot matrix coated with a **red**, a green and a **blue** phosphor array, where the **LED** comprises a sapphire substrate; an AlN buffer layer; an n+-GaN layer with a Ni n side electrode; and a straight side mesa contg. an Al0.2Ga0.8N -well/Al0.25Ga0.75N-barrier MQW active layer interposed between an n-p pair of Al0.3Ga0.7N cladding layers, a p-GaN contact layer and a Ni p electrode.

L72 ANSWER 13 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:324882 HCAPLUS
DN 127:58537
TI Potential applications of III-V nitride semiconductors
AU Morkoc, Hadis
CS Mater. Res. Lab. and Coord. Sci. Lab., Univ. Illinois, Urbana, IL, 61801, USA
SO Mater. Sci. Eng., B (1997), B43(1-3), 137-146
CODEN: MSBTEK; ISSN: 0921-5107
PB Elsevier
DT Journal; General Review
LA English
AB Gallium nitride and its alloys with InN and AlN have recently emerged as important semiconductor materials with applications to yellow, green, **blue** and **UV** portions of the spectrum as emitters and detectors and high power temp electronics. **Blue** and green nitride **LEDs** exhibit brightness levels and longevity well in excess that required for outdoor applications. Combined with the available **red LEDs**, true full color all semiconductor displays can be attained for the first time. If used for traffic

lights and illumination (pending further improvements in **blue** in some cases), these devices can outlast and outperform the incandescent **light** bulbs while saving precious energy. This material system is also intrinsically germane to short wavelength semiconductor lasers for increased data storage. Very recently, pulsed room temp. operation of 410 nm semiconductor lasers, the shortest wavelength ever from a semiconductor, have been reported. Nitrides are also conducive for high power devices/circuits, and sensors and detectors with applications in high temp. and unfriendly environments which leads too ests. that substantial wt. savings can be achieved in aircraft and spacecraft. Moreover, the AlGaN alloy with bandgap above 5.5 eV shows neg. electron affinity surfaces with applications to cold cathodes in general and flat panel displays in particular. 35 Refs.

L72 ANSWER 14 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:723346 HCAPLUS
DN 126:96592
TI Growth and characterization of AlInGaN/InGaN heterostructures
AU Roberts, J. C.; McIntosh, F. G.; Aumer, M.; Joshkin, V.; Boutros, K. S.; Piner, E.; He, Y. W.; El-Masry, N. A.; Bedair, S. M.
CS ECE Dep., North Carolina State Univ., Raleigh, NC, 27695-7911, USA
SO Mater. Res. Soc. Symp. Proc. (1996), 423(III-Nitride, SiC and Diamond Materials for Electronic Devices), 341-346
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB The emission wavelength of the InxGa1-xN ternary system can span from the near **UV** through **red** regions of the visible spectrum. High quality double heterostructures with these InxN active layers are essential in the development of efficient optoelectronic devices such as high performance **light** emitting **diodes** and laser **diodes**. We will report on the MOCVD growth and characterization of thick and thin InGaN films. Thick InxGa1-xN films with values of x up to 0.40 have been deposited and their photoluminescence (PL) spectra measured. AlGaN/InGaN/AlGaN double heterostructures (DHs) have been grown that exhibit PL emission in the violet, **blue**, green and yellow spectral regions, depending on the growth conditions of the thin InGaN active layer. Preliminary results of an AlInGaN/InGaN/AlInGaN DH, with the potential of realizing a near-lattice matched structure, will also be presented.

L72 ANSWER 15 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:441450 HCAPLUS
DN 125:208257
TI Full-color fluorescent display devices using a near-**UV** **light**-emitting **diode**
AU Sato, Yuichi; Takahashi, Mobuyuki; Sato, Susumu
CS Dep. Electrical Electronic Eng., Mining College, Akita Univ., Akita, 010, Japan
SO Jpn. J. Appl. Phys., Part 2 (1996), 35(7A), L838-L839
CODEN: JAPLD8; ISSN: 0021-4922
DT Journal
LA English
AB Full-color fluorescent display devices are demonstrated using a near-**UV** (n-**UV**) **light**-emitting **diode** (**LED**) and various fluorescent films. ZnS:Ag (**blue**), ZnS:Cu,Al (green) and ZnCdS:Ag (**red**) powd. fluors and mixts. of them are dispersed in poly(vinyl alc.) aq. solns., and fluorescent films

are prepd. by spin coating the suspensions to glass slides. The n-**UV light** emitted from a **blue LED** with a high injection current is irradiated onto the films, and the three primary colors and white color are easily obtained.

L72 ANSWER 16 OF 16 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:90243 HCAPLUS
DN 120:90243
TI Gallium indium nitride **blue light**-emitting **diodes**
AU Nagatomo, T.; Kumazaki, A.; Sugihara, T.; Omoto, O.
CS Dep. Electron., Shibaura Inst. Technol., Tokyo, 108, Japan
SO Proc. - Electrochem. Soc. (1993), 93-10(Logic and Functional Devices for Photonics and the Seventeenth State-of-the-Art Program on Compound Semiconductors, 1992), 136-41
CODEN: PESODO; ISSN: 0161-6374
DT Journal
LA English
AB The optical and elec. properties, crystallinity, and photoluminescence of Ga1-xInxN films, and the properties of Al/Ga1-xInxN/GaN **LEDs** are described. These properties of Ga1-xInxN epitaxial films were remarkably improved by photo-assisted MOVPE (metalorg. VPE) using **UV light** from a deuterium lamp. **Blue** d.c. electroluminescence of the Al/Ga1-xInxN/GaN **diodes** has been obsd. at room temp. for the first time. **Blue**, yellow, and **red** emission peaks can be obtained by varying the bias voltage.

L78 ANSWER 1 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:526335 HCAPLUS
DN 135:114251
TI Coated cathodoluminescent **phosphors** II
IN Sanghera, Jasbinder S.; Aggarwal, Ishwar D.
PA USA
SO U.S. Pat. Appl. Publ., 12 pp., Cont.-in-part of U.S. Ser. No. 144,105.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2001008363	A1	20010719	US 2001-755375	20010105
US 144105	A0	19981209	US 1998-144105	19980831
PRAI US 1998-144105	A2	19980831		

AB Particles in powder form for use as **phosphors** are described which comprise an emitting material that can emit visible light in response to direct excitation caused by electrons operating at low voltage; and an elec. conducting, visible light transmitting material disposed on the emitting material to provide an elec. pathway across the particle. Field emission devices are also discussed which comprise a **phosphor** screen of the precoated **phosphor** particles, electron field emitters spaced from the **phosphor** screen, and an elec. source for imparting sufficient elec. power to cause electrons to move from the field emitters toward the **phosphor** screen where light emission takes place on direct excitation of the **phosphor** screen by the electrons emanating from the field emitters.

L78 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:600343 HCAPLUS
DN 133:185289
TI Acidic sodium pyrophosphate-coated **phosphors**, the surface treatment process, and formation of **phosphor** layers
IN Enta, Hisashiro
PA Canon Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000234087	A2	20000829	JP 1999-37453	19990216

AB Acidic Na pyrophosphate-coated **phosphors** are obtained by suspending **phosphors** in org. solvents with b.p. .gtoreq.170.degree. and <190.degree., adding aq. NaH2PO4 dropwise in the suspensions, and refluxing them. The **phosphors** may comprise R2O3 or R2O2S (R = Y, Gd, La) as matrixes and Se, Eu, Tb, and/or Sm as **activators**. The **phosphors** may comprise ZnS as matrixes, Au, Ag, Cu, and/or Mn as **activators** and Cl, Br, and/or Al as coactivators. The **phosphor** films are obtained by screen-printing the coated **phosphors** with binders followed with heating for bonding the **phosphors** with each other. The **phosphor** films are esp. suitable for field emission displays.

L78 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2002 ACS

AN 1998:527032 HCAPLUS
DN 129:167890
TI Visible light-emitting **phosphor** composition having an enhanced luminescent efficiency over a broad range of voltages
IN Chadha, Surjit S.; Watkins, Charles M.
PA Micron Technology, Inc., USA
SO U.S., 8 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5788881	A	19980804	US 1995-548202	19951025
US 6090309	A	20000718	US 1998-93374	19980608

PRAI US 1995-548202 A3 19951025
AB **Phosphor** compns. capable of discharging electrons from a display screen of a luminescent display comprise a mixt. of **phosphor** species, including a dielec. **phosphor** species capable of emitting visible green, blue or red light when subjected to excitation electrons at a relatively high voltage and a conductive **phosphor** species capable of emitting visible green, blue or red light when subjected to energized excitation electrons at a relatively low voltage. The conductive **phosphor** species of the **phosphor** compn. can conduct electrons used to excite cathodoluminescent to the anode of the screen where the spent electrons are discharged. Cathodoluminescent screens employing the **phosphor** compns. and methods for discharging electrons using the compns. are also described.

L78 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:687016 HCAPLUS
DN 127:301089
TI Thin-film electroluminescent devices with **phosphor** layers including a Group IIIA metal-contg. overlayer
IN Sun, Sey-Shing; Bowen, Michael S.
PA USA
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5677594	A	19971014	US 1995-509745	19950801

AB A.c. thin-film electroluminescent devices which comprise an electroluminescent **phosphor**; a pair of insulating layers sandwiching said electroluminescent **phosphor**; and a pair of electrode layers sandwiching said pair of insulating layers are described in which the electroluminescent **phosphor** comprises: a first **phosphor** layer selected from the group consisting of an alk. earth sulfide, an alk. earth selenide, and an alk. earth sulfide selenide, and further including an **activator** dopant; and an overlayer deposited atop the first **phosphor** layer, said overlayer including a Group 3A metal selected aluminum, gallium, and indium. The Group IIIA element may be incorporated within a related **phosphor** host compd. (e.g., the overlayer for SrS **phosphors** may be Ca0.5Sr0.5Ga2S4).

=> D BIB AB 5-19

L78 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:532504 HCAPLUS
DN 127:142594
TI Luminescent materials prepared by coating luminescent compositions onto substrate particles
IN Swanson, Donald Keith; Bruno, Salvatore Anthony
PA E. I. Du Pont De Nemours and Co., USA
SO U.S., 24 pp. Cont.-in-part of U.S. Ser. No. 995,647, abandoned.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5643674	A	19970701	US 1993-67402	19930601
	US 5518808	A	19960521	US 1993-148734	19931105
	WO 9414920	A1	19940707	WO 1993-US11701	19931208
	W: AU, BB, BG, BR, BY, CA, CZ, FI, HU, JP, KP, KR, KZ, LK, LV, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, UZ, VN				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9457360	A1	19940719	AU 1994-57360	19931208
	EP 674688	A1	19951004	EP 1994-903403	19931208
	EP 674688	B1	19990331		
	R: DE, FR, NL				
	JP 08504871	T2	19960528	JP 1993-515175	19931208
	US 5382452	A	19950117	US 1994-202867	19940225
PRAI	US 1992-995647	B2	19921218		
	US 1993-67402	A2	19930601		
	US 1993-148734	A	19931105		
	WO 1993-US11701	W	19931208		

AB Luminescent powder compns. comprise particles with an inert core and .gtoreq.1 luminescent coating on the inert core, the coating(s) (preferably comprising about 2-30 wt. % of the compn.), wherein the inert core comprises .gtoreq.1 of an alk. earth sulfate, an alk. earth phosphate, and an alk. earth fluoride (and, in some embodiments, calcium oxide, calcium carbonate and magnesium oxide); and the luminescent powder compn. has a relative intensity that is at least about 50% of that of a bulk material that consists of a material of the luminescent coating. The av. diam. of the core particles is preferably in the range of from about 0.5 to 20 .mu.m. Fluorescent lamps, cathode-ray tubes, and other light sources employing the **phosphor**-coated particles are also described. Various methods for prepg. the particles are discussed.

L78 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:366069 HCAPLUS
DN 125:71260
TI Luminescent coatings on substrate particles for cost effective plasma display panel applications
IN Bruno, Salvatore A.; Swanson, Donald K.
PA E. I. Du Pont De Nemours and Company, USA
SO U.S., 24 pp. Cont.-in-part of U.S. Ser. No. 67,402.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 3

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI US 5518808 A 19960521 US 1993-148734 19931105
US 5643674 A 19970701 US 1993-67402 19930601
TW 385329 B 20000321 TW 1993-82110013 19931127
WO 9414920 A1 19940707 WO 1993-US11701 19931208
W: AU, BB, BG, BR, BY, CA, CZ, FI, HU, JP, KP, KR, KZ, LK, LV, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, UZ, VN
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
AU 9457360 A1 19940719 AU 1994-57360 19931208
EP 674688 A1 19951004 EP 1994-903403 19931208
EP 674688 B1 19990331
R: DE, FR, NL
JP 08504871 T2 19960528 JP 1993-515175 19931208
PRAI US 1992-995647 B2 19921218
US 1993-67402 A2 19930601
US 1993-148734 A 19931105
WO 1993-US11701 W 19931208

AB Luminescent compns. consisting of core particles coated with a chem. homogeneous layer of luminescent materials are described. The av. diam. of the core particle (e.g. barium sulfate, calcium sulfate, magnesium oxide or calcium fluoride) is in the range of .apprx.0.5 to 20 .mu.m, and the coating corresponds to between .apprx.2 and 30% of the total compn. The compn. can be employed to form a luminescent film or layer within a plasma display panel. A no. of paste and powder compns. are claimed, along with their applications in plasma display panels. In one example, a chelate soln. of the luminescent precursor was decompd. in the presence of disperse core particles, which were then washed, dried and calcined. Activated sulfur may be used to break down the hydrous oxides formed when the chelate is decompd. Alternatively, the core particles can be coated with an oxalate precursor of the luminescent material. The required quantity of relatively expensive rare earth contg. luminescent material is reduced by applying it as a coating to core particles.

L78 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:856473 HCAPLUS
DN 123:301015
TI Green-emitting **phosphor** and color cathode-ray tube using it
IN Shirakawa, Yasuhiro; Sugano, Satoshi; Morikawa, Hiromi
PA Tokyo Shibaura Electric Co, Japan; Toshiba Electronic Eng
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07188653	A2	19950725	JP 1993-335271	19931228

AB The **phosphor**, giving green emission, comprises ZnS:Cua,Aub,Mc,Xd or ZnS:Cua,Aub,Mc,Cee,Xd (M = Pr and/or Tb; X = .gtoreq.1 selected from Group IIIA elements and halogens; 0 < a, b < 10-3; 0 < c, e < 10-1; 0 < d < 10-2). The cathode-ray tube has a fluorescent coating comprising the green-emitting **phosphor**, an Eu-activated rare earth acid sulfide red-emitting **phosphor**, and a Ag-activated Zn sulfide blue-emitting **phosphor**. The cathode-ray tube is useful for imaging displays. The **phosphor** shows improved current satn. characteristics.

L78 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:669807 HCAPLUS
DN 123:155437

TI Color center formation in thin film EL and CL **phosphors** by ion implantation
AU Parodos, Themis; Kalkhoran, Nader M.; Halverson, Ward D.; Maruska, H. Paul; Tuenge, Richard T.; Budzilek, Russell A.; Wadling, Christopher; Morton, David C.
CS Spire Corporation, Bedford, MA, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1995), 2408(Liquid Crystal Materials, Devices and Displays), 207-14
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
AB Ion implantation can introduce color centers into thin film **phosphors** for electroluminescent (EL) and cathodoluminescent (CL) displays. Color pixel patterns are defined through a simple shadow mask that is translated across the thin film **phosphor** host. Thin film samples of the traditional EL and CL hosts ZnS and Zn2SiO4 and thin film CaGa2S4 were prepd. on conducting glass substrates. The samples were implanted with various doses of Cu, Mn, Tb, Sm, Ce, and Eu ions; effects of cation-anion stoichiometry were studied through co-implantation of S, O, F, and Al in combination with the **activator** ion. Post implant anneals were used to redistribute the implanted ions and remove any residual damage. Four-color EL emission (RGBY) in a single thin film panel was demonstrated by implanting Sm, Mn, Tb, and Tm into ZnS. The Mn yellow brightness equaled that of coevapd. films. CaGa2Ga2S4 implanted with Ce showed blue emission of .apprx.1 fL @60 Hz. For thin film CL **phosphor** studies, the authors implanted Cu and Al at different relative doses in ZnS, followed by annealing. CL measurements at 1500 eV showed that emission changed from blue (470 nm) to green (520 nm), depending on the implanted Cu/Al ratio. Bright green CL (531 nm) was achieved by implanting Mn in Zn2SiO4 followed by a relatively high temp. anneal, to form the std. P-1 **phosphor** as a thin film.

L78 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:645135 HCAPLUS
DN 123:43972
TI Pigmented blue-emitting **phosphors** and color cathode-ray tubes
IN Mizukami, Tomohito; Funayama, Jihito; Oguri, Kosei
PA Kasei Optonix, Ltd., Japan
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 24 pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1081704	A	19940209	CN 1992-109052	19920731
	CN 1037188	B	19980128		

AB The title **phosphors** have blue pigments described by the general formula xCoO.cntdot.yZnO.cntdot.zSiO2 (0.05 .ltoreq. x/z .ltoreq. 1.5; and 0.1 .ltoreq. y/z .ltoreq. 2.0) attached to their surfaces. The attached pigments are manufd. by adding basic aq. soln. into Co and Zn soln. to obtain cobalt and zinc hydroxide deposits, using an org. solvent to replace water and to deposit SiO2 on the Co-Zn deposits by hydrolysis, and firing. The kinescopes may contain ZnS:Ag in the blue fluorescent layer, Y2So5:Eu or Y2O3:Eu in the red fluorescent layer and ZnS:Cu/Ag in the green fluorescent layer. Fe2O3 and TiO.cntdot.ZnO.cntdot.CoO.cntdot.NiO pigments are also used on the **phosphors** as attached pigments. The **phosphors** have good adhesion strength, chem. stability and superior spectrum emission properties and can enable kinescopes to have

high brightness and high contrast ratio.

L78 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:689252 HCAPLUS
DN 121:289252
TI Luminescent materials prepared by coating luminescent compositions onto substrate particles
IN Bruno, Salvatore Anthony; Swanson, Donald Keith
PA du Pont de Nemours, E. I., and Co., USA
SO PCT Int. Appl., 50 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9414920	A1	19940707	WO 1993-US11701	19931208
	W: AU, BB, BG, BR, BY, CA, CZ, FI, HU, JP, KP, KR, KZ, LK, LV, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, UZ, VN				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	US 5643674	A	19970701	US 1993-67402	19930601
	US 5518808	A	19960521	US 1993-148734	19931105
	AU 9457360	A1	19940719	AU 1994-57360	19931208
	EP 674688	A1	19951004	EP 1994-903403	19931208
	EP 674688	B1	19990331		
	R: DE, FR, NL				
	JP 08504871	T2	19960528	JP 1993-515175	19931208
PRAI	US 1992-995647	A	19921218		
	US 1993-67402	A	19930601		
	US 1993-148734	A	19931105		
	WO 1993-US11701	W	19931208		

AB Luminescent paste compns. are described which comprise a luminescent powder formed from particles of an inert core material with a luminescent coating; flat plasma display panels employing the powders are also described. The av. diam. of the core particle is in the range of from about 0.5 to 20 .mu., and the coating correspond to between about 2 and 30 wt% of the total compn.

L78 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:616428 HCAPLUS
DN 121:216428
TI Introduction of RGB colors into thin film electroluminescent displays by ion implantation
AU Halverson, Ward; Parodos, T.; Maruska, H. Paul; Tuenge, Richard; Budzilek, Russell A.; Schlam, Elliott
CS Spire Corp., Bedford, MA, 01730, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1994), 2174(Advanced Flat Panel Display Technologies), 212-17
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
AB All emission colors can be introduced into a single layer of thin film electroluminescent (TFEL) **phosphor** by ion implantation. Four colors (RYGB) were demonstrated in undoped ZnS TFEL panels by ion implanting transition metal and rare earth luminescence centers. Full size ion implanted TFEL panels with red, yellow, and green **phosphors** have comparable performance to com. displays with coevapd. **phosphors**. Bright blue, green, and weak red electroluminescence were produced in ion implanted CaGa2S4. Control of

activator charge compensation and depth distribution is important for bright electroluminescence. Ion implantation appears promising to fabricate full color TFEL displays by a simplified procedure, reducing manufg. costs.

L78 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:120375 HCAPLUS
DN 120:120375
TI Methods for producing sulfide-based electroluminescent films by sputtering
IN Kawashima, Tomoyuki; Taniguchi, Harutaka; Kato, Hisato; Shibata, Kazuyoshi
PA Fuji Electric Co., Ltd., Japan
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 4315244	A1	19931111	DE 1993-4315244	19930507
	JP 05315075	A2	19931126	JP 1992-113833	19920507
	US 5482603	A	19960109	US 1993-55104	19930503
	GB 2267388	A1	19931201	GB 1993-9101	19930504
	GB 2267388	B2	19960410		
	US 5716501	A	19980210	US 1995-440400	19950512
PRAI	JP 1992-113833		19920507		
	US 1993-55104		19930503		

AB The title methods, which produce sulfide-based films incorporating rare earth metal emitting centers, entail sputtering a target comprising (a) the non-S component of the sulfide, (b) the non-S component of the sulfide and the rare earth **activator**, or (c) the sulfide in an atm. comprising, resp., (a) a S-contg. compd. and a vaporizable rare earth compd., (b) a S-contg. compd., and (c) a rare earth compd. along with the sputtering gas (e.g., an inert gas).

L78 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:437540 HCAPLUS
DN 119:37540
TI Thermal recording materials providing counterfeit-proof images
IN Matsushita, Toshihiko; Morishita, Sadao
PA Mitsubishi Paper Mills, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04135892	A2	19920511	JP 1990-259870	19900928
	JP 2907518	B2	19990621		
	US 5308824	A	19940503	US 1993-22851	19930225
	US 5407891	A	19950418	US 1994-208661	19940310
PRAI	JP 1990-259870		19900928		
	JP 1990-260680		19900929		
	US 1991-765242		19910925		
	US 1993-22851		19930225		

AB The title materials contain an undercoat layer contg. a white or pale white inorg. fluorescent pigment having a luminous maximal wavelength at 400-700 nm between the substrate and the heat-sensitive layer contg. a dye precursor and a color developer. The material may have a magnetic

recording layer on the backside. The materials provide images capable of preventing counterfeit. Thus, a paper support was coated with a compn. contg. Y2O2S:Eu, calcined kaolin, and binders and with a compn. contg. 3-dibutylamino-6-methyl-7-anilinofluoran and bisphenol A to give a thermal recording paper.

L78 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:112567 HCAPLUS
DN 118:112567
TI Dispersion type electroluminescent **phosphor**
IN Takahara, Takeshi; Saruta, Hisashiro; Oikawa, Mitsuhiro
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 04270779	A2	19920928	JP 1991-31169	19910227

AB The **phosphor** contains ZnS as a base material, Cu and/or Mn as an **activator**, Cl, Br, I, and/or Al as the 1st coactivator, and 1 .times. 10-6 - 1 .times. 10-3 g-atom rare earth element comprising Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu as the 2nd coactivator.

L78 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:162063 HCAPLUS
DN 116:162063
TI Multilayer **phosphor** coatings for electroluminescent picture tubes
IN Harkonen, Gitte; Harkonen, Kari; Tornqvist, Runar
PA Planar International Oy, Finland
SO Finn., 25 pp.
CODEN: FIXXAP
DT Patent
LA Finnish
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI FI 84960	B	19911031	FI 1990-3633	19900718
FI 84960	C	19920210		
US 5314759	A	19940524	US 1991-727662	19910709
DE 4123230	A1	19920123	DE 1991-4123230	19910713
JP 04229989	A2	19920819	JP 1991-176531	19910717
PRAI FI 1990-3633		19900718		

AB In these coatings, consisting of alternatingly arranged, superimposed layers comprising .gtoreq.2 matrix material layers and .gtoreq.1 **activator**-dopant layers, the thickness of the **activator** -dopant layers is .ltoreq.10 nm, and they are so thin that they essentially do not interrupt the crystal growth between the matrix layers. The **activator**-dopant layer may consist of an **activator** layer (thickness .ltoreq.5, preferably .ltoreq.1 nm), and an adapter layer (thickness .ltoreq.5, preferably 0.5-1 nm) arranged between the matrix layer and the adapter layer. These layered structures permits the use of such matrix-**activator** pairs whose use otherwise, as a result of e.g., low activity or weak luminescence, would not be possible. The layered structures are prepd. by at. layer epitaxy (ALE) or mol. beam epitaxy. A multilayer structure of ZnS matrix layers and Al2O3-Sm oxide

intermediate layers was deposited on glass by ALE from ZnCl3 and H2S in inert gas (1 mbar), and from AlCl3 and Sm(thd)3 chelate and water. The Al2O3 reflectivity (2.theta.) was 28.5, and .DELTA.2.theta. was 0.19.degree..

L78 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:111583 HCAPLUS
DN 114:111583
TI Thin-film electroluminescent devices and their fabrication
IN Tonomura, Shoichiro; Matsui, Masahiro; Morishita, Takashi
PA Asahi Chemical Industry Co., Ltd., Japan
SO Ger. Offen., 12 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 4008126	A1	19900920	DE 1990-4008126	19900314
	DE 4008126	C2	19940609		
	GB 2230382	A1	19901017	GB 1990-4983	19900306
	GB 2230382	B2	19930825		

AB The title devices employ a light-emitting layer, formed from a SrS-based material contg. an **activator** which has a peak in the 350-370 nm region, sandwiched between 2 isolating and O2 electrode (1 of which is transparent) layers. Fabrication of the devices entails: forming a thin-film electrode on a glass or quartz substrate; forming an isolating layer on the electrode; forming a SrS-based **phosphor** layer on the isolating layer; heat-treating the **phosphor** layer at .gtoreq.650.degree. for .gtoreq.1 h in an atm. comprising a S-contg. gas selected from H2S, CS2, S vapor, a dialkylsulfide, thiophene, and thiol; forming an isolating layer on the **phosphor** layer; and forming an electrode on the isolating layer. A buffer layer (of, e.g., ZnS, CoS, SrS, CuS, BaS, or CuS) may be formed between the isolation and **phosphor** layers.

L78 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:45277 HCAPLUS
DN 112:45277
TI Preparing an electroluminescent film
IN Mikami, Akiyoshi; Tanaka, Koichi; Taniguchi, Kouji; Yoshida, Masaru; Nakajima, Shigeo
PA Sharp Corp., Japan
SO Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 342063	A2	19891115	EP 1989-304862	19890512
	EP 342063	A3	19910227		
	EP 342063	B1	19940727		
	R: DE, FR, GB				
	JP 01289091	A2	19891121	JP 1988-117943	19880513
	JP 07060738	B4	19950628		
	FI 8902309	A	19891114	FI 1989-2309	19890512
	US 5372839	A	19941213	US 1991-789818	19911112

PRAI JP 1988-117943 19880513
US 1991-348392 19910508

AB Electroluminescent films are formed by a chem. vapor deposition process in which the source gases include vapors of (1) a Group II element and a Group VIA element or a compd. of these capable of forming a Group II chalcogenide semiconductor, and (2) a halide of the activating element. The **activator** halide may be formed by reaction of the activating element or its compd. with a H halide gas.

L78 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:467603 HCAPLUS
DN 111:67603
TI Gallium oxide-zinc oxide **phosphors**, fluorescent compositions, and fluorescent luminous devices
IN Morimoto, Kiyoshi; Toki, Hitoshi; Satoh, Yoshitaka
PA Futaba Denshi Kogyo Co., Ltd., Japan
SO U.S., 27 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4791336	A	19881213	US 1987-66072	19870624
	JP 63006082	A2	19880112	JP 1986-149982	19860626
	JP 02060707	B4	19901218		
	JP 63008475	A2	19880114	JP 1986-152242	19860627
	JP 08030185	B4	19960327		
	JP 63015879	A2	19880122	JP 1986-158872	19860708
	JP 63037183	A2	19880217	JP 1986-180769	19860731
	JP 06062949	B4	19940817		

PRAI JP 1986-149982 19860626
JP 1986-152242 19860627
JP 1986-158872 19860708
JP 1986-164451 19860711
JP 1986-180769 19860731

AB **Phosphors** having the general formula ZnO.Ga2O3:Cd (Ga2O3:ZnO mol. ratio 1:0.54-0) are described; the **phosphors** may include .gtoreq.1 coactivator selected from Ce, Pr, Nd, Sm, Eu, Tb, Dy, Ho, Er, and Tm (when a coactivator is present, the Ga2O3:ZnO ratio is 1:1.4-4.0). The **phosphors** may be excited by UV radiation or electrons, and may have an emission peak at .apprx.365 nm. Fluorescent compns. comprising mixts. of the ZnO.Ga2O3:Cd **phosphors** with other **phosphors** are also described, as are fluorescent luminous display devices.

L78 ANSWER 19 OF 19 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:121756 HCAPLUS
DN 108:121756
TI Sulfide **phosphors** containing boron
IN Yamashita, Yoshinaga; Uchimura, Katsunori
PA Nichia Kagaku Kogyo K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI JP 62201990 A2 19870905 JP 1986-45122 19860301
JP 06025350 B4 19940406

AB B is added to ZnS-, (Cd, Zn)S-, or CdS-based **phosphors** contg. .gtoreq.1 of Ag, Zn, Cu, and Au as the **activator**(s), and contg. .gtoreq.1 of Cl, Br, I, F, Al, Ga, In, Tl, Sb, Bi, Pb, Mn, and Eu as coactivator(s) to improve their resistance to burning. Si, P, and Sb may addnl. be added. The product is useful for cathode-ray tubes for displays. A mixt. contg. ZnS, AgNO3, NaCl, and H3BO3 was fired at 950.degree. for 3 h under a reducing atm. to give a B-doped ZnS:(Ag, Cl) **phosphor** with improved burning resistance.

File 2:INSPEC 1969-2002/Mar W5

Set	Items	Description
S1	7853	LO=420E-9:490E-9
S2	6592	HI=420E-9:490E-9
S3	130382	NI=WAVELENGTH (In metres (m); use WA=)
S4	33	CI=(EU SS(S)ZN SS(S)S SS) (S)NE=3
S5	1181	ZINC()SULFIDE OR ZINC()SULPHIDE
S6	10463	EUROPIUM (January 1969)
S7	6865	CI=EU
S8	2	CI=(CE SS(S)Y SS(S)O SS(S) S SS) (S)NE=4
S9	30	YTTRIUM()OXYSULFIDE OR YTTRIUM()OXYSULFIDE
S10	16613	CERIUM (January 1969)
S11	14689	CI=CE
S12	1	CI=(CE SS(S)Y SS(S)V SS(S) O SS) (S)NE=4
S13	0	YTTRIUM()VANDATE
S14	16613	CERIUM (January 1969)
S15	2055	CI=(GA SS(S) IN SS(S) N SS) (S)NE=3
S16	1	CI=(EU SS(S)ZN SS(S)S SS(S)CE SS) (S)NE=4
S17	5000	S1(S)S2(S)S3
S18	0	S17 AND S4
S19	14	(S6 OR S7) AND S5
S20	0	S19 AND S17
S21	9	S19 NOT S4
S22	0	(S10 OR S11) AND S9
S23	148824	DOPE OR DOPING OR DOPED OR DOPANT OR DOPANTS
S24	8	S9 AND S23
S25	740131	ELECTROLUMIN? OR PHOTODIODE OR LIGHT OR LASER OR LUMIN? OR LIQUID()CRYSTAL OR LC
S26	1173	S15 AND S25
S27	729	S15 AND DIODE?
S28	1181	S26 OR S27
S29	96	S28 AND S17
S30	54388	CI=P
S31	3	S29 AND (S30 OR PHOSPHORUS)
S32	3	S31 NOT (S4 OR S8 OR S9 OR S12 OR S16 OR S19 OR S21 OR S24)
S33	35	S28 AND (S30 OR PHOSPHORUS)
S34	32	S33 NOT (S4 OR S8 OR S9 OR S12 OR S16 OR S19 OR S21 OR S24 OR S32)
S35	68	S29 AND BLUE
S36	14	S29 AND S23
S37	14	S36 NOT (S4 OR S8 OR S9 OR S12 OR S16 OR S19 OR S21 OR S24 OR S31 OR S34)
S38	2	S5 AND (S6 OR S7) AND (S11 OR S10)
S39	0	S38 NOT (S4 OR S8 OR S9 OR S12 OR S16 OR S19 OR S21 OR S24 OR S31 OR S34 OR S37)

4/3,AB/3
DIALOG(R)File 2:INSPEC

7016821 INSPEC Abstract Number: A2001-19-7860H-003, B2001-10-4220M-012
Title: Preparation and characterization of rare earth activator doped nanocrystal phosphors
Author(s): Ihara, M.; Igarashi, T.; Kusunoki, T.; Ohno, K.
Author Affiliation: Sony Corp., Kanagawa, Japan
Conference Title: Society for Information Display 1999 International Symposium p.1026-9
Publisher: Soc. Inf. Display (SID), Santa Ana, CA, USA
Publication Date: 1999 Country of Publication: USA CD-ROM pp.
Material Identity Number: XX-1999-01213
Conference Title: Proceedings of the 1999 SID International Symposium, Seminar & Exhibition
Conference Date: 18-20 May 1999 Conference Location: San Jose, CA, USA
Language: English
Abstract: The photoluminescent intensities of nanocrystal ZnS:Tb and ZnS:Eu synthesized by the new method were 2.5 and 2.8 times stronger than those of bulk (conventional). Furthermore, taking charge compensation into account, the luminescent efficiencies of nanocrystal ZnS:Tb and ZnS:Eu could be improved. Cathodoluminescence of nanocrystal ZnS:Tb and ZnS:Eu could be successfully observed for the first time. These nanocrystal phosphors are considered for applications in FED, EL, PDP and CRT.
Subfile: A B

4/3,AB/5
DIALOG(R)File 2:INSPEC

6889647 INSPEC Abstract Number: A2001-10-7855-010
Title: Photoluminescence of Eu/sup 2+/ doped ZnS nanocrystals
Author(s): Liu Shu-Man; Guo Hai-Qing; Zhang Zhi-Hua; Liu Feng-Qi; Wang Zhan-Guo
Author Affiliation: Inst. of Semicond., Acad. Sinica, Beijing, China
Journal: Chinese Physics Letters vol.17, no.8 p.609-11
Publisher: Chinese Phys. Soc,
Publication Date: 2000 Country of Publication: China
CODEN: CPLEEU ISSN: 0256-307X
SICI: 0256-307X(2000)17:8L.609:PDN;1-8
Material Identity Number: H857-2001-005
Language: English
Abstract: Eu/sup 2+/ doped ZnS nanocrystals exhibit new luminescence properties because of the enlarged energy gap of the nanocrystalline ZnS host due to quantum confinement effects. Photoluminescence emission at about 520 nm from Eu/sup 2+/ doped ZnS nanocrystals at room temperature is investigated using photoluminescence emission and excitation spectroscopy. Such green emission with a long lifetime (ms) is proposed to be the result of excitation, ionization, and carrier recapture and recombination via Eu/sup 2+/ centers in the nanocrystalline ZnS host.
Subfile: A

4/3,AB/7
DIALOG(R)File 2:INSPEC

6768979 INSPEC Abstract Number: A2001-01-7855-032, B2001-01-4220M-002
Title: Rare-earth materials for use in the dark
Author(s): Tianzhi Zhang; Qiang Su
Author Affiliation: Lab. of Rare Earth Chem. & Phys., Acad. Sinica, Changchun, China
Journal: Journal of the Society for Information Display vol.8, no.1 p.27-30
Publisher: Soc. Inf. Display,
Publication Date: 2000 Country of Publication: USA
CODEN: JSIDE8 ISSN: 0734-1768
SICI: 0734-1768(2000)8:1L.27:REMD;1-T
Material Identity Number: P997-2000-002
U.S. Copyright Clearance Center Code: 0734-1768/2000/0801-0027$1.00
Language: English
Abstract: Recently, it was found that some materials doped with rare-earth ions show bright and long-lasting phosphorescence. They donor includes radioactive elements and can be safely used as luminous paints for use in the dark. Some of them are better than the traditional zinc sulfide doped with copper (ZnS:Cu). The most important rare-earth materials with long-lasting phosphorescence are aluminates such as alkaline-earth aluminates MAl/sub 2/O/sub 4/:Eu/sup 2+/, Dy/sup 3+/ (M=Sr, Ca)/sup 1/ and garnets Y/sub 3/Ga/sub 5/O/sub 12/:Tb/sup 3+/, Gd/sub 3/Ga/sub 5/O/sub 12/:Tb/sup 3+/, Cd/sub 3/Al/sub 2/Ge/sub 3/O/sub 12/:Tb/sup 3+/, Cd/sub 3/M/sub 2/Ge/sub 3/O/sub 12/:Pr/sup 3+/ (M=Al,Ge), Y/sub 3/Al/sub 5-x/Ga/sub x/O/sub 12/:Ce/sup 3+/ (x=3, 3.5). Some oxides such as InBO/sub 3/:Tb/sup 3+/, Ba/sub 2/SiO/sub 4/:Dy/sup 3+/ also show longlasting phosphorescence properties. Other sulfide materials include ZnS:Eu, Ca/sub x/Sr/sub 1-x/S:Bi,Tm,Cu or Ca/sub x/Sr/sub 1-x/S:Eu. Alkaline-earth aluminates MAl/sub 2/O/sub 4/:Eu/sup 2+/ (M=Mg, Ca, Sr, Ba) codoped with RE/sup 3+/ (RE=Y, La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu) were synthesized by using homogeneous precipitation method.
Subfile: A B

4/3,AB/8

DIALOG(R)File 2:INSPEC

6647249 INSPEC Abstract Number: A2000-16-7855-063
Title: Preparation and characterization of rare earth activators doped nanocrystal phosphors
Author(s): Ihara, M.; Igaeashi, T.; Kusunoki, T.; Ohno, K.
Author Affiliation: Sony Corp., Atsugi, Japan
Journal: Journal of the Electrochemical Society vol.147, no.6 p. 2355-7
Publisher: Electrochem. Soc,
Publication Date: June 2000 Country of Publication: USA
CODEN: JESOAN ISSN: 0013-4651
SICI: 0013-4651(200006)147:6L.2355:PCRE;1-4
Material Identity Number: J010-2000-005
U.S. Copyright Clearance Center Code: 0013-4651/2000/$7.00
Language: English
Abstract: The photoluminescent intensities of nanocrystal ZnS:Tb and ZnS:Eu synthesized using a new technique were 2.5 and 2.8 times higher than those of bulk phosphors. Taking charge compensation into account, the luminescent efficiency of the nanocrystals can be improved. The cathodoluminescence of the nanocrystals was observed for the first time. These nanocrystal phosphors are promising for field emission display, electroluminescence, plasma-display panels, and cathode ray tubes.
Subfile: A

4/3,AB/9
DIALOG(R)File 2:INSPEC

6575942 INSPEC Abstract Number: A2000-11-7855-042
Title: Energy structure and fluorescence of Eu/sup 2+/ in ZnS:Eu nanoparticles
Author(s): Wei Chen; Malm, J.-O.; Zwiller, V.; Yining Huang; Shuman Liu; Wallenberg, R.; Bovin, J.-O.; Samuelson, L.
Author Affiliation: Dept. of Chem., Univ. of Western Ontario, London, Ont., Canada
Journal: Physical Review B (Condensed Matter) vol.61, no.16 p. 11021-4
Publisher: APS through AIP,
Publication Date: 15 April 2000 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(20000415)61:16L.11021:ESFN;1-Q
Material Identity Number: P279-2000-017
U.S. Copyright Clearance Center Code: 0163-1829/2000/61(16)/11021(4)/$15.00
Language: English
Abstract: Eu/sup 2+/-doped ZnS nanoparticles with an average size of around 3 nm were prepared, and an emission band around 530 nm was observed. By heating in air at 150 degrees C, this emission decreased, while the typical sharp line emission of Eu/sup 3+/ increased. This suggests that the emission around 530 nm is from intraion transition of Eu/sup 2+/. In bulk ZnS:Eu/sup 2+/, no intraion transition of Eu/sup 2+/ was observed because the excited states of Eu/sup 2+/ are degenerate with the continuum of the ZnS conduction band. We show that the band gap in ZnS:Eu/sup 2+/ nanoparticles opens up due to quantum confinement, such that the conduction band of ZnS is higher than the first excited state of Eu/sup 2+/, thus

enabling the intraion transition of Eu/sup 2+/ to occur.
Subfile: A

4/3,AB/10
DIALOG(R)File 2:INSPEC

6150396 INSPEC Abstract Number: A1999-05-7855-036
Title: Photoluminescence of ZnS nanoparticles doped with europium ions in a polymer matrix
Author(s): Papakonstantinou, D.D.; Huang, J.; Lianos, P.
Author Affiliation: Dept. of Eng. Sci., Patras Univ., Greece
Journal: Journal of Materials Science Letters vol.17, no.18 p. 1571-3
Publisher: Kluwer Academic Publishers,
Publication Date: 15 Sept. 1998 Country of Publication: USA
CODEN: JMSLD5 ISSN: 0261-8028
SICI: 0261-8028(19980915)17:18L.1571:PNDW;1-G
Material Identity Number: H146-1999-001
U.S. Copyright Clearance Center Code: 0261-8028/98/$9.50
Language: English
Abstract: We report the synthesis of ZnS nanocrystals with a diameter of about 4.0 nm. Their photophysical properties have been studied in the presence of metal ions. We have found that trivalent ions, e.g., europium and other rare-earth ions, greatly enhance photoluminescence yield. The exclusivity of trivalent ions stems from the fact that they are strongly attracted to the polymer matrix by interaction with oxygen.
Subfile: A

4/3,AB/11
DIALOG(R)File 2:INSPEC

6059902 INSPEC Abstract Number: A9823-7855-034
Title: Study of the optical properties of Eu/sup 3+/-doped ZnS nanocrystals
Author(s): Sun Lingdong; Yan Chunhua; Liu Changhui; Liao Chunsheng; Li Dan; Yu Jiaqi
Author Affiliation: State Key Lab. of Rare Earth Mater. Chem. & Applications, Beijing Univ., China
Journal: Journal of Alloys and Compounds Conference Title: J. Alloys Compd. (Switzerland) vol.275-277 p.234-7
Publisher: Elsevier,
Publication Date: 24 July 1998 Country of Publication: Switzerland
CODEN: JALCEU ISSN: 0925-8388
SICI: 0925-8388(19980724)275/277L.234:SOPD;1-R
Material Identity Number: O876-98011
U.S. Copyright Clearance Center Code: 0925-8388/98/$19.00
Conference Title: 3rd International Conference on f Elements (ICFE-3)
Conference Date: 14-19 Sept. 1997 Conference Location: Paris, France
Language: English
Abstract: Absorption and photoluminescence excitation spectra are presented for ZnS:Eu nanocrystals. The average size of the ZnS:Eu nanocrystals was about 3.6 nm deduced from the absorption spectra and was independent of the doping concentration of Eu/sup 3+/. The characteristic

luminescence from the /sup 5/D/sub 0/-/sup 7/F/sub J/ (J=0, 1, 2) transition of Eu/sup 3+/ was observed. This is attributed to the electrons and holes being localized around Eu/sup 3+/, and the possibility of energy transfer from band to band excitation in ZnS to trivalent rare earth Eu/sup 3+/ is increased. The location of Eu/sup 3+/ is different for different doping concentrations deduced from the relative luminescence intensity. Three main types of Eu/sup 3+/ ion exist in the colloid. The samples undergo growth and aging processes according to the variation of the luminescence intensity after preparation. A tentative explanation is given that the location of the Eu/sup 3+/ ions and the surface states may play important roles.
Subfile: A

4/3,AB/12
DIALOG(R)File 2:INSPEC

5985203 INSPEC Abstract Number: A9817-6855-125, B9809-0520F-068
Title: Study of the phase states for Zn-Eu-S system thin films obtained by CVD method
Author(s): Bessergenev, V.G.; Ivanova, E.N.; Kovalevskaya, Yu.A.; Vasilieva, I.G.
Author Affiliation: Inst. of Inorg. Chem., Acad. of Sci., Novosibirsk, Russia
Conference Title: Chemical Vapor Deposition. Proceedings of the Fourteenth International Conference and EUROCVD-11 p.1451-8
Editor(s): Allendorf, M.D.; Bernard, C.
Publisher: Electrochem. Soc, Pennington, NJ, USA
Publication Date: 1997 Country of Publication: USA xxii+1652 pp.
ISBN: 1 56677 178 1 Material Identity Number: XX98-00571
Conference Title: Chemical Vapor Deposition Proceedings of the Fourteenth International Conference and EUROCVD-11
Conference Sponsor: Electrochem. Soc.; American Ceramic Soc.; Mater. Res. Soc.; U.S. Dept. Energy Office of Ind. Concepts; et al
Conference Date: 5-9 Sept. 1997 Conference Location: Paris, France
Language: English
Abstract: The results of employment of new volatile complex compounds for synthesis of Zn/sub x/Eu/sub 1-x/S (0<x<1) films by CVD method are reported. The Zn and Eu compounds from the dithiocarbamate class were used. The spatial chemical homogeneity of the films was estimated by a new differential dissolution method. It has been shown that Eu could be uniformly distributed over ZnS matrix up to concentration of 0.6 mol.%. This concentration is essentially higher than it is known for crystals (0.02 mol.%). When the concentration of Eu was higher than 2-4 mol.%, the phase decomposition on non-interacting phases ZnS and EuS have been observed. However, when the concentration of Eu higher than 95-97 mol.%, the dissolution of Zn over EuS matrix was observed.
Subfile: A B

4/3,AB/13
DIALOG(R)File 2:INSPEC

5979679 INSPEC Abstract Number: A9817-7855-015, B9809-4220M-002
Title: Luminescence characteristics of impurities-activated ZnS

nanocrystals prepared in microemulsion with hydrothermal treatment
Author(s): Xu, S.J.; Chua, S.J.; Liu, B.; Gan, L.M.; Chew, C.H.; Xu, G.Q.
Author Affiliation: Inst. of Mater. Res. & Eng., Nat. Univ. of Singapore, Singapore
Journal: Applied Physics Letters vol.73, no.4 p.478-80
Publisher: AIP,
Publication Date: 27 July 1998 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19980727)73:4L.478:LCIA;1-T
Material Identity Number: A135-98031
U.S. Copyright Clearance Center Code: 0003-6951/98/73(4)/478(3)/$15.00
Language: English
Abstract: Cu-, Eu-, or Mn-doped ZnS nanocrystalline phosphors were prepared at room temperature using a chemical synthesis method. Transmission electron microscopy observation shows that the size of the ZnS clusters is in the 3-18 nm range. New luminescence characteristics such as strong and stable visible-light emissions with different colors were observed from the doped ZnS nanocrystals at room temperature. These results strongly suggest that impurities, especially transition metals and rare-earth metals-activated ZnS nanoclusters form a new class of luminescent materials.
Subfile: A B

4/3,AB/14
DIALOG(R)File 2:INSPEC

5757662 INSPEC Abstract Number: A9801-8115H-013, B9801-0520F-021
Title: Synthesis and properties of ZnS-EuS films grown from volatile complex compounds
Author(s): Bessergenev, V.G.; Ivanova, E.N.; Kovalevskaya, Yu.A.; Vasilieva, I.G.; Varand, V.L.; Zemskova, S.M.; Larionov, S.V.; Kolesov, R.A.; Ayupov, R.M.; Logvinenko, V.A.
Author Affiliation: Inst. of Inorg. Chem., Acad. of Sci., Novosibirsk, Russia
Journal: Materials Research Bulletin vol.32, no.10 p.1403-10
Publisher: Elsevier,
Publication Date: Oct. 1997 Country of Publication: USA
CODEN: MRBUAC ISSN: 0025-5408
SICI: 0025-5408(199710)32:10L.1403:SRFG;1-M
Material Identity Number: M033-97010
U.S. Copyright Clearance Center Code: 0025-5408/97/$17.00+.00
Language: English
Abstract: Deposition and characterization of films of ZnS, EuS and ZnS:Eu are described. The films have been prepared by chemical vapor deposition using new volatile complex compounds, dithiocarbamates of Zn and Eu, as precursors. Characterization includes X-ray diffraction, chemical analysis of the film composition, Raman spectroscopy, ellipsometry, and spectrophotometry. The spatial chemical homogeneity of the films has been determined using a recently developed method of differential dissolution and found to be uniform. Doping of ZnS by Eu with dopant concentration up to 0.3 at.% has been achieved. Effects of Eu doping on structural and optical properties of the films are presented.
Subfile: A B

4/3,AB/15
DIALOG(R)File 2:INSPEC

5748494 INSPEC Abstract Number: A9724-7865-033
Title: Ellipsometric and spectrophotometric investigation of ZnS and ZnS:Eu films prepared from volatile complex compounds
Author(s): Ayupov, B.M.; Ivanova, E.A.; Kovalevskaya, Yu.A.
Journal: Avtometriya no.2 p.50-5
Publisher: Allerton Press,
Publication Date: 1997 Country of Publication: Russia
CODEN: AVMEBI ISSN: 0320-7102
SICI: 0320-7102(1997)2L.50;1-A
Material Identity Number: I718-97005
Translated in: Optoelectronics, Instrumentation and Data Processing no.2 p.46-50
Publication Date: 1997 Country of Publication: USA
CODEN: OIDPE4 ISSN: 8756-6990
SICI of Translation: 8756-6990(1997)2L.46:ESIF;1-W
U.S. Copyright Clearance Center Code: 8756-6990/97/$50.00
Language: English
Abstract: The methods of single-wave null ellipsometry and spectrophotometry in the visible region of the spectrum were used to investigate Eu-doped and undoped ZnS films fabricated from volatile complex Zn and Eu compounds by thermal vapor deposition. The inverse problem solution in ellipsometry using a three-layer film model in the case of undoped films yields a constant value of the refractive index over film thickness; the constancy is violated in the case of Eu doping. It is shown that undoped ZnS films are anisotropic, and the mean size of their diffusing centers grows with film thickness.
Subfile: A

4/3,AB/16
DIALOG(R)File 2:INSPEC

5696653 INSPEC Abstract Number: A9720-7855-189, B9710-4220M-019
Title: Doped semiconductor and insulator nanocrystalline phosphors
Author(s): Goldburt, E.T.; Bhargava, R.N.
Author Affiliation: Nanocrystals Technol., Briarcliff Manor, NY, USA
Conference Title: Proceedings of the International Symposium on Advanced Luminescent Materials p.368-81
Editor(s): Lockwood, D.J.; Fauchet, P.M.; Koshida, N.; Brueck, S.R.J.
Publisher: Electrochem. Soc, Pennington, NJ, USA
Publication Date: 1996 Country of Publication: USA ix+495 pp.
Material Identity Number: XX96-03599
Conference Title: Proceedings of the International Symposium on Advanced Luminescent Materials
Conference Sponsor: Electrochem. Soc
Conference Date: 8-13 Oct. 1995 Conference Location: Chicago, IL, USA
Language: English
Abstract: This work represents expansion of Mn doped ZnS work and concentrates on preparation and optical spectroscopy of Mn, Eu, and Tb doped nanocrystals of zinc sulfide and Eu and Tb doped nanocrystals of yttria. The original synthesis was modified to improve the stability of the nanocrystals. Novel sol-gel processing techniques were developed to synthesize Y/sub 2/O/sub 3/:Eu and Y/sub 2/O/sub 3/:Tb nanocrystals. In

addition, a new synthesis was developed to incorporate Tb/sup 3+/ and Eu/sup 3+/ in zinc sulfide nanocrystals. The characteristic green emission of Tb/sup 3+/ and red emission of Eu/sup 3+/ (d/sup 5/-f/sup 7/ transition) respectively, has been observed. In addition, the comparison is made between the intensity of Tb/sup 3+/ emission in standard terbium doped LaOBr phosphor and terbium doped nanocrystalline yttria phosphor.
Subfile: A B

4/3,AB/17
DIALOG(R)File 2:INSPEC

5091774 INSPEC Abstract Number: A9523-7155-003
Title: Rare earth ionization, carrier trapping and exciton binding
Author(s): Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Journal: Journal of Alloys and Compounds Conference Title: J. Alloys Compd. (Switzerland) vol.225, no.1-2 p.41-4
Publication Date: 15 July 1995 Country of Publication: Switzerland
CODEN: JALCEU ISSN: 0925-8388
U.S. Copyright Clearance Center Code: 0925-8388/95/$09.50
Conference Title: 2nd International Conference on f-Elements
Conference Sponsor: Univ. Helsinki; Helsinki Univ. Technol.; Minist. Educ.; et al
Conference Date: 1-6 Aug. 1994 Conference Location: Helsinki, Finland
Language: English
Abstract: Excitation processes of rare earth (RE) ions are discussed. These involve RE ionization (impact ionization), carrier trapping and finally an exciton binding. The previous electron spin resonance studies of ZnS:Eu and new results of optically detected cyclotron resonance studies of InP:Yb indicate rather small carrier trapping rates by RE ions. The non-radiative recombination transitions of RE ions are also described.
Subfile: A

4/3,AB/18
DIALOG(R)File 2:INSPEC

4566343 INSPEC Abstract Number: A9403-7135-006
Title: Eu and Yb excitation mechanisms in ZnS, CaS, SrS and InP
Author(s): Godlewski, M.; Swiatek, K.; Monemar, B.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Conference Title: Rare Earth Doped Semiconductors Symposium p.275-80
Editor(s): Pomrenke, G.S.; Klein, P.B.; Langer, D.W.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1993 Country of Publication: USA xv+418 pp.
Conference Date: 13-15 April 1993 Conference Location: San Francisco, CA, USA
Language: English
Abstract: The role of the excitonic excitation mechanism of the rare earth (RE) intra-shell emission is discussed. Two cases are analyzed. For Yb ion in InP 4f-4f emission of Yb/sup 3+/ is induced by energy transfer from bound exciton state to the RE core state. For Eu in CaS and SrS RE emission is induced by carrier trapping directly to the excited state of Eu/sup 2+/ ion. Also in this case the intermediate excitonic state may

participate in RE excitation, as suggested by some experimental results.
Subfile: A

4/3,AB/19
DIALOG(R)File 2:INSPEC

04054966 INSPEC Abstract Number: A9203-7135-012
Title: Rare earth bound excitons-a new class of excitons bound at isoelectronic centers and complexes in semiconductors
Author(s): Swiatek, K.; Suchocki, A.; Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Conference Title: 20th International Conference on the Physics of Semiconductors p.1923-6 vol.3
Editor(s): Anastassakis, E.M.; Joannopoulos, J.D.
Publisher: World Scientific, Singapore
Publication Date: 1990 Country of Publication: Singapore 3 vol. (xxxvii+xxiv+xxiii+2676) pp.
ISBN: 981 02 0539 2
Conference Sponsor: Aristotle Univ.; Comm. Eur. Communities; et al
Conference Date: 6-10 Aug. 1990 Conference Location: Thessaloniki, Greece
Language: English
Abstract: The authors present recent results on a new class of isoelectronic bound excitons (IBE), i.e. excitons bound at either isolated or complex rare earth (RE) centers in semiconductors. The experimental results for Eu, Yb, and Sm in ZnS are discussed.
Subfile: A

4/3,AB/20
DIALOG(R)File 2:INSPEC

03937703 INSPEC Abstract Number: A91103986
Title: On the nature of Eu-related emissions in ZnS and CaS
Author(s): Swiatek, K.; Godlewski, M.; Niinisto, L.; Leskela, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warszawa, Poland
Journal: Acta Physica Polonica A vol.79, no.2-3 p.255-7
Publication Date: Feb.-March 1991 Country of Publication: Poland
CODEN: ATPLB6 ISSN: 0587-4246
Conference Title: XIX International School on Physics of Semiconducting Compounds
Conference Date: 22-28 April 1990 Conference Location: Jaszowiec, Poland
Language: English
Abstract: The Eu-connected recombination processes in ZnS and CaS are analyzed on the basis of optical studies. A new Eu-related emission in ZnS is attributed to the recombination of an exciton bound at the Eu/sup 2+/ center, while in CaS the emission is dominated by the direct Eu/sup 2+/ intra-ion transition.
Subfile: A

4/3,AB/21
DIALOG(R)File 2:INSPEC

03906723 INSPEC Abstract Number: A91080807
Title: ZnS:Eu thin film electroluminescent devices prepared by RF magnetron sputtering
Author(s): Aozasa, M.; Chen, H.; Ando, K.
Author Affiliation: Dept. of Electr. Eng., Fac. of Eng., Osaka City Univ., Japan
Journal: Thin Solid Films vol.199, no.1 p.129-38
Publication Date: 1 April 1991 Country of Publication: Switzerland
CODEN: THSFAP ISSN: 0040-6090
U.S. Copyright Clearance Center Code: 0040-6090/91/$3.50
Language: English
Abstract: ZnS:Eu electroluminescent devices with a single insulating layer were prepared by RF magnetron sputtering. It was found that the optimum concentration of europium dopant in the sputtering target is 0.94 mol.%. The luminescence level of this device is much lower than that of ZnS:Mn devices at a dopant concentration of about 1.0 mol.%. X-ray diffraction study shows that the crystallinity of ZnS:Eu phosphor is inferior to that of ZnS:Mn phosphor, which is a reason for the poor luminous characteristics of ZnS:Eu devices.
Subfile: A

4/3,AB/22
DIALOG(R)File 2:INSPEC

03893025 INSPEC Abstract Number: A91074784
Title: On the correlation between energy structure and the mechanism of recombination for rare earth ions in solids
Author(s): Swiatek, K.; Suchocki, A.; Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Journal: Journal of Luminescence vol.48-49, pt.2 p.527-30
Publication Date: Jan.-Feb. 1991 Country of Publication: Netherlands
CODEN: JLUMA8 ISSN: 0022-2313
U.S. Copyright Clearance Center Code: 0022-2313/91/$03.50
Conference Title: International Conference on Luminescence (ICL-90)
Conference Sponsor: Comm. Eur. Communities; IUPAP: et al
Conference Date: 16-20 July 1990 Conference Location: Lisbon, Portugal
Language: English
Abstract: An efficient mechanism of rare earth (RE) intra-ion excitation due to nonradiative bound exciton (BE) recombination is discussed. The authors first show that some RE ions, those which can change their charge state, bind excitons RE bound excitons recombine nonradiatively due to the impurity Auger effect i.e. energy transfer to core states, which results in core excitation, followed by an intra-ion emission. The correlation between the energy structure of an RE-BE system and the recombination mechanism is discussed from examples of Eu, Yb and Sm impurities in ZnS, and Eu in Ca/sub x/Cd/sub 1-x/F/sub 2/ crystals.
Subfile: A

4/3,AB/23
DIALOG(R)File 2:INSPEC

03791017 INSPEC Abstract Number: A91018776
Title: Luminescence efficiency under impact ionization excitation in ZnS
Author(s): Swiatek, K.; Suchocki, A.; Godlewski, M.

Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warszawa, Poland
Journal: Acta Polytechnica Scandinavica, Applied Physics Series no.Ph170 p.281-4
Publication Date: 1990 Country of Publication: Finland
CODEN: APSSDG ISSN: 0355-2721
Conference Title: 5th International Workshop on Electroluminescence
Conference Date: 11-13 June 1990 Conference Location: Espoo, Finland
Language: English
Abstract: The efficiency of the impact ionization mechanism of RE intra-ion excitation is discussed. It is shown that for Yb, Sm and Eu in ZnS, RE emission is induced due to the impurity Auger effect. Participation of bound excitons in the RE excitation process may limit the otherwise large efficiency of the impact ionization electroluminescence excitation.
Subfile: A

4/3,AB/24
DIALOG(R)File 2:INSPEC

03791011 INSPEC Abstract Number: A91018736
Title: On the excitation of Eu-related emissions in ZnS and CaS
Author(s): Swiatek, K.; Godlewski, M.; Hommel, D.; Leskela, M.; Niinisto, L.; Nykanen, E.; Soininen, P.; Titta, M.
Author Affiliation: Inst. of Phys., Polish Acad of Sci., Warsaw, Poland
Journal: Acta Polytechnica Scandinavica, Applied Physics Series no.Ph170 p.237-40
Publication Date: 1990 Country of Publication: Finland
CODEN: APSSDG ISSN: 0355-2721
Conference Title: 5th International Workshop on Electroluminescence
Conference Date: 11-13 June 1990 Conference Location: Espoo, Finland
Language: English
Abstract: The nature of Eu-related emissions in ZnS and CaS is discussed on the basis of ESR and optical measurements. The bound exciton mechanism is proposed for Eu recombination in ZnS, whereas the red emission in CaS is due to4f/sup 6/5d/sup 1/ implies 4f/sup 7/ transition of Eu/sup 2+/.
Subfile: A

4/3,AB/25
DIALOG(R)File 2:INSPEC

03751907 INSPEC Abstract Number: A90147552
Title: Deep europium-bound exciton in a ZnS lattice
Author(s): Swiatek, K.; Godlewski, M.; Hommel, D.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warszawa, Poland
Journal: Physical Review B (Condensed Matter) vol.42, no.6 p. 3628-33
Publication Date: 15 Aug. 1990 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
Language: English
Abstract: Eu-related recombination processes in ZnS are discussed on the basis of electron-spin-resonance (ESR) and optical studies. The absence of any Eu/sup 2+/ and/or Eu/sup 3+/ intra-ion emissions is explained as a consequence of the midgap position of Eu/sup 2+/ in ZnS. A new Eu-related infrared emission is observed and attributed to a bound-exciton (BE)

recombination. In the Eu-bound exciton the hole is strongly localized on the 4f shell of Eu, whereas the electron is either delocalized on the 12 nearest-neighbor Zn-cation sites (for isolated Eu) or trapped at a compensating ion (for Eu complexes). The BE dissociation energy is determined to be about 10 meV.
Subfile: A

4/3,AB/26
DIALOG(R)File 2:INSPEC

03712688 INSPEC Abstract Number: A90126037
Title: Deep rare earth (RE) ions related energy levels in ZnS
Author(s): Swiatek, K.; Suchocki, A.; Przybylinska, H.; Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Journal: Journal of Crystal Growth vol.101, no.1-4 p.435-8
Publication Date: April 1990 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
U.S. Copyright Clearance Center Code: 0022-0248/90/$03.50
Conference Title: Fourth International Conference on II-VI Compounds
Conference Date: 17-22 Sept. 1989 Conference Location: Berlin, West Germany
Language: English
Abstract: An analysis of RE/sup 2+/3+/ energy level positions in ZnS is presented. It is shown that the concepts of Jorgensen's refined spin-pairing energy theory (RESPET) may be extended to charge transfer (sulfur to RE) transitions in ZnS:RE. The theoretical results are verified by photon-electron spin resonance (ESR) studies of 3+ to 2+ photoionization transitions of Eu and Yb in ZnS. It is shown that the 4f-4f luminescence excitation spectrum of Yb/sup 3+/ has a photoionization nature. The arguments for the binding of a deep exciton by RE/sup 3+/ complexes are presented and discussed.
Subfile: A

4/3,AB/27
DIALOG(R)File 2:INSPEC

03503669 INSPEC Abstract Number: A89141885
Title: On the incorporation of rare earth ions into II-VI compounds: ZnS:Eu
Author(s): Swiatek, K.; Godlewski, M.; Hommel, D.; Hartmann, H.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland

Journal: Physica Status Solidi A vol.114, no.1 p.127-33
Publication Date: 16 July 1989 Country of Publication: East Germany
CODEN: PSSABA ISSN: 0031-8965
Language: English
Abstract: The problem of the incorporation of rare earth (RE) ions into the ZnS lattice is discussed on the basis of ZnS doped with europium. The symmetry of the Eu centre observed to ESR measurements is determined and the concentration estimated from the ESR signal compared with the average amount of europium in the crystals measured by Rutherford backscattering (RBS) technique. Based on a variety of samples and X-ray data on crystal structure and perfection some conclusions are given on the solubility of RE ions in II-VI compounds.
Subfile: A

4/3,AB/28
DIALOG(R)File 2:INSPEC

03394861 INSPEC Abstract Number: A89076869
Title: X-ray characterization of precipitates in HgTe:Eu and ZnS:Eu crystals
Author(s): Jasiolek, G.; Golacki, Z.; Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsawa, Poland
Journal: Journal of the Physics and Chemistry of Solids vol.50, no.3 p.277-82
Publication Date: 1989 Country of Publication: UK
CODEN: JPCSAW ISSN: 0022-3697
U.S. Copyright Clearance Center Code: 0022-3697/89/$3.00+0.00
Language: English
Abstract: Quantitative analysis on HgTe and ZnS crystals doped with Eu was carried out using an electron probe microanalyser. The analysis revealed the presence of precipitates enriched in europium. Concentration of the dopant element in the HgTe crystal was equal to 0.46 and 0.57 wt.% for the ZnS crystal. The precipitates which occurred in the HgTe:Eu crystal were identified as the Eu/sub 4/Te/sub 7/ phase while the ones found in the ZnS:Eu crystal were ascertained to be a mixture of ZnEu/sub 2/S/sub 4/ and ZnS. The presence of trivalent europium in the precipitates was confirmed by X-ray emission spectroscopic studies.
Subfile: A

4/3,AB/29
DIALOG(R)File 2:INSPEC

03374970 INSPEC Abstract Number: A89066589
Title: Line spectrum emission of Eu-activated ZnS
Author(s): Kynev, K.; Kuk, V.
Author Affiliation: Dept. of Inorg. Chem., Sofia Univ., Bulgaria
Journal: Zeitschrift fur Naturforschung, Teil A (Physik, Physikalische Chemie, Kosmophysik) vol.44A, no.1 p.81-3
Publication Date: Jan. 1989 Country of Publication: West Germany
CODEN: ZENAAU ISSN: 0932-0784
U.S. Copyright Clearance Center Code: 0932-0784/89/0100-0081$01.30/0
Language: English
Abstract: It is shown that a ZnS:Eu phosphor with line emission spectrum can be prepared without coactivator introduction, contrary to previous results. The broad-band emission established in ZnS:Eu,Li is ascribed to the formation of Eu/sup 2+/ centres due to the removal of lattice stress by lithium incorporation.
Subfile: A

4/3,AB/30
DIALOG(R)File 2:INSPEC

03256828 INSPEC Abstract Number: A88141026
Title: Influence of plastic deformation on the luminescence and electron paramagnetic resonance of ZnS-Eu crystals
Author(s): Arkhangel'skiy, G.Ye.; Grigor'ev, N.N.; Fok, M.V.; Yakunina,

N.A.
Book Title: Luminescence and anisotropy of zinc sulfide crystals p. 55-132
Editor(s): Galanin, M.D.
Translator(s): Hendzel, K.S.
Publisher: Nova Science Publishers, Commack, NY, USA
Publication Date: 1988 Country of Publication: USA vi+170 pp.
ISBN: 0 941743 20 9
Language: English
Abstract: This study investigates the influence of plastic deformation by uniaxial compression on the luminescence and EPR spectra of ZnS-Eu crystals. Comparing the transformation of structural stacking faults (hexagonal interlayers) in closely-packed atomic layers in the cubic lattice of a ZnS crystal during deformation to observed changes in the EPR spectra and luminescence polarization made it possible to identify the structure of centers formed by europium. It is demonstrated that the Eu/sup 2+/ ions embedded in the lattice sites at the Zn/sup 2+/ ion sites create several types of centers of a nonassociative nature responsible both for the luminescent and paramagnetic properties of ZnS-Eu crystals. It is determined that at least three types of centers exist with axial symmetry and one type of center with cubic nearest neighbor symmetry. The axial centers are located in one-, two-, and three-layered stacking faults of the hexagonal structure, while the cubic centers are located at the regular ZnS lattice sites. The high degree of luminescence polarization is attributed to intracrystalline fields induced by the stacking faults which orient the radiating and absorbing dipoles of the Eu/sup 2+/ centers.
Subfile: A

4/3,AB/31
DIALOG(R)File 2:INSPEC

03196623 INSPEC Abstract Number: A88105655
Title: Kinetics of luminescence polarization in europium- and thulium-activated single crystals of zinc sulfide
Author(s): Grigor'yev, N.N.; Ovchinnikov, A.V.; Fok, M.V.
Book Title: Luninescence centers of rare earth ions in crystal phosphors p.117-39
Editor(s): Galanin, M.D.
Translator(s): Allen, M.L.
Publisher: Nova Science Publishers, Commack, NY, USA
Publication Date: 1988 Country of Publication: USA vi+161 pp.
ISBN: 0 941743 10 1
Language: English
Abstract: During research on afterglow in ZnS-Eu crystals it was discovered that the degree of luminescence polarization grows from 10 to 30% at room temperature over a period of about 10 mu s after excitation by optical pulses 10 ns long with wavelength lambda =337 nm, and this was valid for all three elemental bands, ascribed to Eu, which are the result of spectrum decomposition by the Alentsev method. Investigation of the temperature dependence of the rate of increase in the degree of polarization demonstrated that a potential barrier of about 0.37 eV is overcome during ordering of the orientations of the radiators. The degree of luminescence polarization in ZnS-Tm afterglow, on the other hand, drops off from 20% to 0 in a few milliseconds. Both phenomena are explained by the fact that the hexagonal interlayer field in ZnS has a much stronger effect on RE/sup 3+/ ions than RE/sup 2+/, forcing the RE/sup 3+/ ions to move preferentially into one of four Jahn-Teller potential wells, which

causes the preferred orientation of the radiator to be along the C-axis of the crystal. Differences in the sign of the effect are explained by the fact that Eu is found in the Eu/sup 3+/ state only until the luminescence center is ionized, whereas the Tm/sup 3+/ ions are presented in unexcited ZnS and convert to Tm/sup 2+/ as a result of ionization of the luminescence centers.
Subfile: A

4/3,AB/32
DIALOG(R)File 2:INSPEC

03196620 INSPEC Abstract Number: A88100984
Title: Luninescence centers of rare earth ions in crystal phosphors
Editor(s): Galanin, M.D.
Translator(s): Allen, M.L.
Publisher: Nova Science Publishers, Commack, NY, USA
Publication Date: 1988 Country of Publication: USA vi+161 pp.
ISBN: 0 941743 10 1
Language: English
Abstract: The following topics were dealt with: anti-Stokes radiation conversion ZnS:Tm and ZnS:Eu luminescence centres; luminescence polarisation; electrolytic activation. Abstracts of individual papers can be found under the relevant classification codes in this or other issues.
Subfile: A

4/3,AB/33
DIALOG(R)File 2:INSPEC

03129941 INSPEC Abstract Number: A88069610
Title: Mechanism of Eu ion substitution in ZnS and ZnSe lattices
Author(s): Swiatek, K.; Godlewski, M.
Author Affiliation: Inst. of Phys., Polish Acad. of Sci., Warsaw, Poland
Journal: Acta Physica Polonica A vol.A73, no.2 p.271-4
Publication Date: Feb. 1988 Country of Publication: Poland
CODEN: ATPLB6 ISSN: 0587-4246
Conference Title: XVI School on Physics of Semiconducting Compounds, Jaszowiec 87
Conference Date: 6-11 April 1987 Conference Location: Ustron-Zawodzie, Poland
Language: English
Abstract: The electron spin resonance (ESR) spectra of Eu/sup 2+/ in ZnSe and wurtzite-phase ZnS (1970) crystals have been measured. The spin Hamiltonian parameters describing the spectrum of ZnS:Eu are determined and compared with those obtained by Schehl and Wigen (1970) for Eu/sup 2+/ in CdS and by Title for Eu/sup 2+/ in CdSe. From these data the authors conclude that part of europium ions enters ZnS lattice substitutionally (zinc site) without any close charge compensation. The majority of the Eu centers enter, however, sites of lower symmetry and were not observed in ESR studies.
Subfile: A

? T S21/3,AB/1-9

21/3,AB/1
DIALOG(R)File 2:INSPEC

6188202 INSPEC Abstract Number: A1999-08-7860H-001, B1999-04-7260B-022
Title: Preparation of spherical phosphors by thermal-plasma treatment
Author(s): Matsuda, N.; Tamatani, M.; Okumura, M.; Albessard, A.K.; Inoue, Y.; Kawasaki, K.
Author Affiliation: Mater. & Devices Res. Labs., Toshiba Corp., Kawasaki, Japan
Journal: Journal of the Society for Information Display
Conference Title: J. Soc. Inf. Disp. (USA) vol.6, no.3 p.159-61
Publisher: Soc. Inf. Display,
Publication Date: 1998 Country of Publication: USA
CODEN: JSIDE8 ISSN: 0734-1768
SICI: 0734-1768(1998)6:3L.159:PSPT;1-S
Material Identity Number: P997-1999-001
U.S. Copyright Clearance Center Code: 0734-1768/98/0602-0159$1.00
Conference Title: 2nd International Conference on the Science and Technology of Display Phosphors
Conference Date: 18-20 Nov. 1996 Conference Location: San Diego, CA, USA
Language: English
Abstract: Garnet-structured rare-earth oxysulfide and *zinc* *sulfide* phosphors such as Y/sub 3/(Al,Ga)/sub 5/O/sub 12/:Tb, Y/sub 2/O/sub 2/S:Eu, and ZnS:Ag,Cl were treated by thermal plasma in order to obtain spherically shaped phosphor particles. Although spherical particles of garnet phosphor and rare-earth oxysulfide phosphor were obtained, their cathodoluminescence properties were lowered. However, the properties could be partially restored by optimized heat treatment.
Subfile: A B

21/3,AB/2
DIALOG(R)File 2:INSPEC

04340731 INSPEC Abstract Number: A9306-6170B-005
Title: Achievements and problems in physical chemistry of polycrystal phosphors
Author(s): Gurvich, A.M.
Author Affiliation: Rontgen Radiol. Res. Inst., Moscow, Russia
Journal: Izvestiya Rossiiskoi Akademii Nauk. Seriya Fizicheskaya vol.56, no.2
Publication Date: 1992 Country of Publication: Russia
Translated in: Bulletin of the Russian Academy of Sciences. Physics vol.56, no.2 p.240-4
Publication Date: 1992 Country of Publication: USA
ISSN: 1062-8738
U.S. Copyright Clearance Center Code: 1062-8738/92/$20.00
Conference Title: All-Union Conference on Luminescence. Dedicated to the Centenary of Academician S.I. Vavilov
Conference Date: March 1991 Conference Location: Moscow, Russia
Language: English
Abstract: The computer simulation of thermodynamic equilibrium

concentrations of point defects in BaFBr:Eu-phosphor is carried out. The necessity of taking into account their segregation in the region of the dislocations and grain interfaces is shown. Extended defects of such kind are too found to affect essentially the formation process and properties of alkali-halide and *zinc*-*sulphide* phosphors.
Subfile: A

21/3,AB/3
DIALOG(R)File 2:INSPEC

03256827 INSPEC Abstract Number: A88141030
Title: Investigation of electron-phonon interaction in ZnS by electroluminescence technique in weak fields
Author(s): Botoev, A.N.; L'vova, E.Yu.; Fok, M.V.
Book Title: Luminescence and anisotropy of *zinc* *sulfide* crystals p.1-54
Editor(s): Galanin, M.D.
Translator(s): Hendzel, K.S.
Publisher: Nova Science Publishers, Commack, NY, USA
Publication Date: 1988 Country of Publication: USA vi+170 pp.
ISBN: 0 941743 20 9
Language: English
Abstract: The electroluminescence of ZnS-Cu, SM; ZnS-Cu, Eu; ZnS-Cu, Tm crystals in static, sinusoidal, and pulsed fields of the order 10/sup 3/ V/cm and higher is generated by the impact ionization of impurities and the atoms of the primary materials. This conclusion is confirmed by calculation accounting for electron scattering by phonons and the structural features of the energy bands of the test crystals. Moreover it is demonstrated that the excitation of these crystals by square-wave voltage pulses will produce piezoelectric oscillations.
Subfile: A

21/3,AB/4
DIALOG(R)File 2:INSPEC

02994686 INSPEC Abstract Number: A87132343
Title: Variation of the electroluminescence quantum yield of ZnS-Cu with Sm, Eu, Pb, or Tm crystals with frequency of applied voltage
Author(s): Dem'yanov, V.V.; L'vova, E.Yu.; Fok, M.V.
Journal: Zhurnal Prikladnoi Spektroskopii vol.45, no.4 p.596-601
Publication Date: Oct. 1986 Country of Publication: Byelorussian SSR, USSR
CODEN: ZPSBAX ISSN: 0514-7506
Translated in: Journal of Applied Spectroscopy vol.45, no.4 p.1055-9
Publication Date: Oct. 1986 Country of Publication: USA
CODEN: JASYAP ISSN: 0021-9037
U.S. Copyright Clearance Center Code: 0021-9037/86/4504-1055$12.50
Language: English
Abstract: The volume luminescence of ZnS-Cu with Sm, Eu, Pb, or Tm crystals was studied by Gorbacheva et al. (1982) and Botoev et al. (1982) with constant voltage excitation in fields on the order of 10/sup 3/-10/sup 4/ V/cm and its fundamental properties were studied. Experimental verification of earlier expressed theoretical ideas about the excitation of prebreakdown luminescence of *zinc* *sulfide* crystals was obtained. This then permitted study of electron-phonon interaction in these crystals by

the electroluminescence technique. Since crystals glow quite brightly when excited by an applied voltage, it was of interest to study in more detail their characteristics in an applied sinusoidal field. The electroluminescence quantum yield eta (i.e. the ratio of intensity of the glow produced in number of quanta to the current in number of electrons passing through the crystal) was calculated as a function of the frequency of the exciting voltage.
Subfile: A

21/3,AB/5
DIALOG(R)File 2:INSPEC

02891168 INSPEC Abstract Number: A87070130
Title: *Zinc* *sulphide* thin films doped with rare earth ions
Author(s): Tammenmaa, M.; Leskela, M.; Koskinen, T.; Niinisto, L.
Author Affiliation: Dept. of Chem., Helsinki Univ. of Technol., Espoo, Finland
Journal: Journal of the Less-Common Metals vol.126 p.209-14
Publication Date: Dec. 1986 Country of Publication: Switzerland
CODEN: JCOMAH ISSN: 0022-5088
U.S. Copyright Clearance Center Code: 0022-5088/86/$3.50
Conference Title: Seventeenth Rare Earth Research Conference
Conference Date: 9-12 June 1986 Conference Location: Hamilton, Ont., Canada
Language: English
Abstract: *Zinc* *sulphide* thin films doped with trivalent rare earths (cerium, *europium*, terbium, thulium) have been grown by the atomic layer epitaxy (ALE) method using hydrogen sulphide and zinc chloride or acetate as starting materials and rare earth beta -diketonates as dopants. The films were characterized by X-ray diffraction and X-ray fluorescence techniques and their photoluminescence was studied. It is possible by ALE to grow thin films of good quality and to control the distribution of the rare earth ions in the ZnS matrix. The most intense luminescence was obtained with Ce/sup 3+/ and Tb/sup 3+/. *Europium* also gave a distinct luminescence while that of thulium remained poor. The band gap of ZnS was apparent in the excitation spectra and its energy depended on the crystal structure of the *zinc* *sulphide* thin film (cubic or hexagonal).
Subfile: A

21/3,AB/6
DIALOG(R)File 2:INSPEC

02794868 INSPEC Abstract Number: A87013184
Title: Oxygen in activator centers of *zinc* *sulfide*
Author(s): Golubeva, N.P.; Fok, M.V.
Journal: Zhurnal Prikladnoi Spektroskopii vol.43, no.5 p.793-8
Publication Date: Nov. 1985 Country of Publication: Byelorussian SSR, USSR
CODEN: ZPSBAX ISSN: 0514-7506
Translated in: Journal of Applied Spectroscopy vol.43, no.5 p.1259-63
Publication Date: Nov. 1985 Country of Publication: USA
CODEN: JASYAP ISSN: 0021-9037
U.S. Copyright Clearance Center Code: 0021-9037/85/4305-1259$09.50
Language: English
Abstract: ZnS luminophores without an especially introduced activator but

with the inevitably present oxygen are characterized by radiative recombination mainly in regions containing oxygen. In activated ZnS all typical activators are at defective ZnS interlayers in which the oxygen must be localized because of the hexagonal structure of the interlayers. It cannot be ruled out that the oxygen also causes layer faults by preventing the lattice from converting from the hexagonal modification to the cubic when the ZnS is cooled below the transition temperature. Within the limits of a hexagonal interlayer, the closer approach of the activator to the oxygen can be caused by the requirements of volume compensation, provided that the activator io is greater than the zinc ion replaced by it and may also results from the greater affinity of the activator to oxygen than to sulfur and the activator's tendency to form complexes. In order to obtain an idea of how *europium* and the other rare-earth activators behave in an environment full of oxygen, zinc oxide was activated with Eu, Tm, and Dy nitrate salts in activator concentrations of 10/sup -2/ mass %. The spectra were compared with the spectra of nonactivated ZnO, measured under the same conditions; the nonactivated ZnO had been calcined in oxygen or ammonia which favoured the development of zinc vacancies and of superstoichiometric zinc, respectively. A comparison of the spectra reveals that the introduction of the rare-earth activator, as well as calcining and oxygen, lead to the development of zinc vacancies, and that the maximum is shifted toward longer wavelengths to a greater extent than in ZnO-Zn obtained by calcining ZnO in ammonia.
Subfile: A

21/3,AB/7
DIALOG(R)File 2:INSPEC

01797010 INSPEC Abstract Number: A82016662
Title: Structural changes in *zinc* *sulfide* crystals following plastic deformation
Author(s): Arkhangel'skii, G.E.; Fok, M.V.; Yakunina, N.A.
Journal: Sbornik Kratkie Soobshcheniya po Fizike, AN SSSR, Fizicheskii Institut im. P.N. Lebedeva no.3 p.8-13
Publication Date: 1980 Country of Publication: USSR
Translated in: Soviet Physics - Lebedev Institute Reports no.3 p.6-11
Publication Date: 1980 Country of Publication: USA
CODEN: SPLRD6 ISSN: 0364-2321
Language: English
Abstract: Three types of stacking faults were observed in cubic ZnS:Eu crystals and their transformation into the cubic phase in the course of plastic deformation was tracked.
Subfile: A

21/3,AB/8
DIALOG(R)File 2:INSPEC

01091124 INSPEC Abstract Number: A77069875
Title: On the origin of the fluorescence of trivalent *europium* in the *zinc* *sulphide* matrix
Author(s): Charreire, Y.; Loriers, J.
Author Affiliation: CNRS, Meudon, France
Journal: Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences, Serie B (Sciences Physiques) vol.284, no.21 p.475-8
Publication Date: 6 June 1977 Country of Publication: France

CODEN: CHDBAN ISSN: 0151-0509
Language: French
Abstract: The red fluorescence of trivalent *europium* associated in *zinc* *sulfide* with another but optically inactive lanthanide ion (La, Gd) originates from rare earth oxysulfide inclusions, that are always formed during the preparation of the compounds. This interpretation results from the examination of the materials by X-ray diffraction, optical and electron microscopy and from the study of their absorption, excitation and luminescence spectra.
Subfile: A

21/3,AB/9
DIALOG(R)File 2:INSPEC

00149077 INSPEC Abstract Number: A70044903, B70020744
Title: Fluorescence of trivalent associated gadolinium-*europium* and lanthanum-*europium* ions in the hexagonal crystalline lattices of *zinc* *sulphide* and cadmium sulphide
Author(s): Bancie-Grillot, M.; Bourtayre, P.; Grillot, E.
Journal: Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences, Serie B (Sciences Physiques) vol.270, no.9 p.612-15
Publication Date: 2 March 1970 Country of Publication: France
CODEN: CHDBAN ISSN: 0151-0509
Language: French
Abstract: The authors show that in ZnS and CdS, the Eu/sup 3+/ ion gives a fluorescence emission associated with another trivalent lanthanide ion (specially Gd/sup 3+/ and La/sup 3+/). The distance in the crystal between the sensitizers Gd/sup 3+/ or La/sup 3+/ and the emitters Eu/sup 3+/ is sufficiently small that they have different influences on the crystal field at the Eu/sup 3+/ sites. ZnS:Eu, La is shown to be a very good luminophor with red emission and high quantum yield.

8/3,AB/1
DIALOG(R)File 2:INSPEC

6045109 INSPEC Abstract Number: A9822-7630K-001
Title: EPR of the Kramers ions Er/sup 3+/, Nd/sup 3+/, Yb/sup 3+/ and Ce/sup 3+/ in Y(NO/sub 3/)/sub 3/.6H/sub 2/O and Y/sub 2/(SO/sub 4/)/sub 3/.8H/sub 2/O single crystals: study of hyperfine transitions
Author(s): Misra, S.K.; Isber, S.
Author Affiliation: Dept. of Phys., Concordia Univ., Montreal, Que., Canada
Journal: Physica B vol.253, no.1-2 p.111-22
Publisher: Elsevier,
Publication Date: Oct. 1998 Country of Publication: Netherlands
CODEN: PHYBE3 ISSN: 0921-4526
SICI: 0921-4526(199810)253:1/2L.111:KI33;1-S
Material Identity Number: M742-98013
U.S. Copyright Clearance Center Code: 0921-4526/98/$19.00
Language: English
Abstract: X-band (~9.45 GHz) electron paramagnetic resonance (EPR) spectra of the Kramers ions Er/sup 3+/, Nd/sup 3+/, Yb/sup 3+/ and Ce/sup 3+/ substituting by about ~1% Y/sup 3+/ ions, in yttrium trinitate hexahydrate [Y(NO/sub 3/)/sub 3/.6H/sub 2/O] and yttrium trisulphate octahydrate [Y/sub 2/(SO/sub 4/)/sub 3/.8H/sub 2/O] single crystals were recorded at liquid-helium temperatures. Hyperfine EPR transitions were observed for the isotopes of Er, Nd and Yb, except for the Ce/sup 3+/ ion which possesses no isotope with non-zero nuclear moment. The spectra indicate the presence of two magnetically-inequivalent R/sup 3+/ sites in unit cell in the Y/sub 2/(SO/sub 4/)/sub 3/.8H/sub 2/O crystal, and one site in Y(NO/sub 3/)/sub 3/.6H/sub 2/O crystal. The values of the elements of the (anisotropic) g/sup 2/ and A/sup 2/ tensors were estimated using a rigorous least-squares fitting procedure fitting simultaneously all resonant EPR line positions observed for numerous orientations of the external magnetic field in three mutually perpendicular planes. The absolute signs of the elements of A-matrix and orientations of g- and A-matrices relative to the magnetic axes of the Gd/sup 3+/ ion, present naturally as impurity in these crystals, were determined.
Subfile: A

8/3,AB/2
DIALOG(R)File 2:INSPEC

4818219 INSPEC Abstract Number: A9424-2960-044, B9412-7430-047
Title: Spectroscopic analysis of proton induced fluorescence from yttrium orthosilicate
Author(s): Hollerman, W.A.; Fisher, J.H.; Holland, L.R.; Czirr, J.B.
Author Affiliation: Nichols Res. Corp., Huntsville, AL, USA
Part vol.1 p.637-40 vol.1
Editor(s): Klaisner, L.
Publisher: IEEE, New York, NY, USA
Publication Date: 1993 Country of Publication: USA 3 vol. 1930 pp.
ISBN: 0 7803 1487 5
U.S. Copyright Clearance Center Code: 0 7803 1487 5/94/$04.00
Conference Title: 1993 IEEE Conference Record Nuclear Science Symposium and Medical Imaging Conference

Conference Date: 31 Oct.-6 Nov. 1993 Conference Location: San Francisco, CA, USA

Language: English

Abstract: In September 1992, the authors completed a 3 MeV proton irradiation test on two yttrium orthosilicate doped with cerium (YOS:Ce) crystal samples. The principle goal of this test was to determine the proton dose required to reduce the resulting YOS:Ce fluorescence light to half of its original value (half brightness dose) at ambient temperature and 150 degrees C. Results from this test will also provide basic information concerning potential changes in spectral composition and fluorescence peak widths for YOS:Ce at ambient temperature and 150 degrees C.

24/3,AB/1
DIALOG(R)File 2:INSPEC

6312732 INSPEC Abstract Number: A1999-17-6170B-005
Title: First-principles study of intrinsic defects in *yttrium* *oxysulfide*
Author(s): Mikami, M.; Oshiyama, A.
Author Affiliation: Yokohama Res. Centre, Mitsubishi Chem. Corp., Yokohama, Japan
Journal: Physical Review B (Condensed Matter) vol.60, no.3 p. 1707-15
Publisher: APS through AIP,
Publication Date: 15 July 1999 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19990715)60:3L.1707:FPSI;1-Y
Material Identity Number: P279-1999-027
U.S. Copyright Clearance Center Code: 0163-1829/99/60(3)/1707(9)/$15.00
Language: English
Abstract: Atomic and electronic structures of intrinsic point defects in yttrium oxysulfides (Y/sub 2/O/sub 2/S) are studied by first-principles total-energy calculations based on density-functional theory combined with normconserving pseudopotentials. Energetics of all the intrinsic point defects are determined for a variety of charge states. From the energetics, the concentrations of the anion vacancies and the interstitial anions are found to be larger than those of the yttrium vacancy and the interstitial yttrium atom under practical conditions. It is also found that the oxygen vacancy, the sulfur vacancy, and the interstitial sulfur atom induce relatively deep levels in the energy gap, whereas the interstitial oxygen atom induces relatively shallow acceptor levels. These findings are consistent with observed broad-band blue luminescence in undoped *yttrium* *oxysulfide* , existence of shallow acceptor levels in oxysulfides, and are presumably related to persistent phosphorescence and energy storage phenomena in Eu-*doped* oxysulfides. Furthermore, negative-U characters are found in the oxygen vacancy and the interstitial sulfur. These behaviors of the defects can be explained from the viewpoint of the covalent bonds newly appearing around the defects in the ionic host material.
Subfile: A

24/3,AB/2
DIALOG(R)File 2:INSPEC

6260608 INSPEC Abstract Number: A1999-13-7855-024
Title: Luminescent optical ceramic based on terbium-*doped* *yttrium* *oxysulfide*
Author(s): Ananeva, G.V.; Gorokhova, E.I.; Kinzhibalo, L.N.; Kuprevich, V.V.; Merkulyaeva, T.I.; Kristich, O.A.
Author Affiliation: Vavilov (S.I.) State Opt. Inst., St. Petersburg, Russia
Journal: Optiko-Mekhanicheskaya Promyshlennost vol.66, no.5 p.27-32
Publisher: Opt. Soc. America,
Publication Date: May 1999 Country of Publication: Russia
CODEN: OPMPAQ ISSN: 0030-4042
SICI: 0030-4042(199905)66:5L.27;1-N
Material Identity Number: C266-1999-005

Translated in: Journal of Optical Technology vol.66, no.5 p.404-8
Publication Date: May 1999 Country of Publication: USA
CODEN: JOTEE4 ISSN: 1070-9762
SICI of Translation: 1070-9762(199905)66:5L.404:LOCB;1-V
U.S. Copyright Clearance Center Code: 1070-9762/99/050404-5$15.00
Language: English
Abstract: This paper discusses how the characteristics of the starting material affect the structural and optical characteristics of a ceramic. The limiting parameters are determined for the synthesis of the starting powder and the hot pressing of an Y/sub 2/O/sub 2/S-Tb ceramic. It is shown that a luminescent optical ceramic transparent to the intrinsic radiation is formed by texturing the material along the (001) plane.
Subfile: A

24/3,AB/3
DIALOG(R)File 2:INSPEC

4727202 INSPEC Abstract Number: A9418-4281P-009, B9409-7230E-022
Title: Fiber optic temperature sensor using a Y/sub 2/O/sub 2/S:Eu thermographic phosphor
Author(s): Smith, T.V.; Smith, D.B.
Author Affiliation: Dept. of Phys., Bethel Coll., St. Paul, MN, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.2070 p.456-63
Publication Date: 1994 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
U.S. Copyright Clearance Center Code: 0 8194 1335 6/94/$6.00
Conference Title: Fiber Optic and Laser Sensors XI
Conference Sponsor: SPIE
Conference Date: 7-8 Sept. 1993 Conference Location: Boston, MA, USA
Language: English
Abstract: The authors detail the development and testing of a thermographic-phosphor-based fiber-optic temperature sensor. The sensor is constructed by removing a region of the fiber jacket and cladding, then coating the exposed core with *yttrium* *oxysulfide* *doped* with a europium activator (Y/sub 2/O/sub 2/S:Eu). When photoexcited, the europium in the host lattice emits a sharp-line fluorescence spectrum that is characteristic of the temperature of the host crystal lattice. By measuring fluorescence lifetimes one can deduce the temperature of an optical fiber that is in thermal contact with the fiber. Two different distributions of Y/sub 2/O/sub 2/S:Eu in the cladding region were evaluated with regard to light coupling efficiency. Theoretical waveguide calculations indicate that a thin core/cladding boundary distribution of Y/sub 2/O/sub 2/S:Eu couples light more efficiently into the cores guided modes than does a bulk distribution of phosphor in the cladding. The sensor tests showed reproducible response from 20 to 180 degrees Celsius.
Subfile: A B

24/3,AB/4
DIALOG(R)File 2:INSPEC

04114959 INSPEC Abstract Number: A9209-7855-007
Title: Spectral investigation of single crystals of *yttrium* *oxysulfide* *doped* with Nd/sup 3+/

Author(s): Antonov, V.A.; Arsen'ev, P.A.; Markushev, V.M.; Kholodnyi, D.S.
Author Affiliation: Moscow Energy Inst., USSR
Journal: Zhurnal Prikladnoi Spektroskopii vol.54, no.2 p.254-8
Publication Date: Feb. 1991 Country of Publication: Byelorussian SSR, USSR
CODEN: ZPSBAX ISSN: 0514-7506
Translated in: Journal of Applied Spectroscopy vol.54, no.2 p.160-3
Publication Date: Feb. 1991 Country of Publication: USA
CODEN: JASYAP ISSN: 0021-9037
U.S. Copyright Clearance Center Code: 0021-9037/91/5402-0160$12.50
Language: English
Abstract: Oxysulfides of the rare-earth elements (RE/sub 2/O/sub 2/S, where RE is a rare earth ion) are well known as effective luminophores. Single crystals of lanthanum oxysulfide activated with neodymium are in active medium with a high gain. The results of spectral-luminescent investigations of Y/sub 2/O/sub 2/S:Nd/sup 3+/ single crystals with application of the method of selective laser spectroscopy are given. Previously such investigations were performed only on powders. The applied methods of synthesis of oxysulfides in the form of powders did not permit completely avoiding foreign phases, since in their synthesis a number of chemical processes proceed simultaneously, characterized by finite equilibrium constants. The multiphase character of the charge in turn exerts a negative effect on the quality of the crystals grown.
Subfile: A

24/3,AB/5
DIALOG(R)File 2:INSPEC

03218976 INSPEC Abstract Number: A88118386
Title: Emission properties of phosphors for high temperature sensor applications
Author(s): Bugos, A.R.; Allison, S.W.; Beshears, D.L.; Cates, M.R.
Author Affiliation: Tennessee Univ., Knoxville, TN, USA
Conference Title: Conference Proceedings: 1988 IEEE SOUTHEASTCON (Cat. No.88CH2571-8) p.228-33
Publisher: IEEE, New York, NY, USA
Publication Date: 1988 Country of Publication: USA 693 pp.
U.S. Copyright Clearance Center Code: CH2571-8/88/0000-0228$01.00
Conference Sponsor: IEEE
Conference Date: 11-13 April 1988 Conference Location: Knoxville, TN, USA
Language: English
Abstract: The excitation and emission spectra of several thermographic phosphors, europium-*doped* yttrium oxide (Y/sub 2/O/sub 3/:Eu/sup 3+/), europium-*doped* yttrium vanadate (YVO/sub 4/: Eu/sup 3+/), europium-*doped* barium phosphate (Ba/sub 3/(PO/sub 4/)/sub 2/: Eu/sup 2+/), gadolinium-*doped* yttrium oxide (Y/sub 2/O/sub 3/: Gd), and praseodymium-*doped* *yttrium* *oxysulfide* (Y/sub 2/O/sub 2/S: Pr), have been measured as a function of temperature. The charge transfer (C-T) absorption bands for each phosphor were studied for spectral shifts and broadening. Of these particular thermophosphors, europium-*doped* yttrium oxide, europium-*doped* yttrium vanadate, and europium-*doped* barium phosphate show significant change in absorption band spectral position and broadening at elevated temperatures.
Subfile: A

24/3,AB/6
DIALOG(R)File 2:INSPEC

03029937 INSPEC Abstract Number: B88004668
Title: Phosphor-based thermometry of rotating surfaces
Author(s): Mannik, L.; Brown, S.K.; Campbell, S.R.
Author Affiliation: Ontario Hydro Res. Div., Toronto, Ont., Canada
Journal: Applied Optics vol.26, no.18 p.4014-17
Publication Date: 15 Sept. 1987 Country of Publication: USA
CODEN: APOPAI ISSN: 0003-6935
U.S. Copyright Clearance Center Code: 0003-6935/87/184014-04$02.00/0
Language: English
Abstract: The use of phosphor thermometry in generator rotor temperature monitoring over the 60-150 degrees C range has been investigated, using measurements of the decay time of the visible emission stimulated in europium-*doped* *yttrium* *oxysulfide* by UV laser excitation. A fiber-optic system for light delivery and collection has been designed and tested in laboratory measurements on a rotating disk. Measurements of the effect of oil and a magnetic field on sensor performance are reported.
Subfile: B

24/3,AB/7
DIALOG(R)File 2:INSPEC

00895211 INSPEC Abstract Number: A76036342
Title: Synthesis and luminescence properties of europium-activated *yttrium* *oxysulfide* phosphors
Author(s): Koskenlinna, M.; Leskela, M.; Niinisto, L.
Author Affiliation: Dept. of Chem., Helsinki Univ. of Technol., Otaniemi, Finland
Journal: Journal of the Electrochemical Society vol.123, no.1 p. 75-8
Publication Date: Jan. 1976 Country of Publication: USA
CODEN: JESOAN ISSN: 0013-4651
Language: English
Abstract: A new method of preparing brightly emitting Eu:Y/sub 2/O/sub 2/S phosphors is described. Yttrium sulfite *doped* with Eu is used as starting material and the Eu-activated oxysulfide is obtained from it either directly by reducing the sulfite with carbon monoxide, or by first oxidising sulfite and then reducing the obtained oxysulfate. The properties of the phosphors and the effect of impurities on their luminescence spectra are briefly discussed.
Subfile: A

24/3,AB/8
DIALOG(R)File 2:INSPEC

00093125 INSPEC Abstract Number: A70009030
Title: Fluorescence of trivalent-europium-*doped* *yttrium* *oxysulfide*
Author(s): Sovers, O.J.; Yoshioka, T.
Author Affiliation: Bayside Lab., Research Center General Telephone & Electronics Lab. Inc., Bayside, NY, USA
Journal: Journal of Chemical Physics vol.49, no.11 p.4945-54

Publication Date: 1 Dec. 1969 Country of Publication: USA
CODEN: JCPSA6 ISSN: 0021-9606
Language: English

Abstract: The fluorescence spectrum of trivalent europium in the site of C/sub 3v/ symmetry of polycrystalline Y/sub 2/O/sub 2/S:Eu/sup 3+/ is investigated in the region 4000-9000 AA. Of the total of 363 transitions between the crystal components of the J=0 to J=3 states of /sup 5/D and those of the J=0 to 0J=6 states of /sup 7/F, almost two thirds are observed. Transitions originating in the /sup 5/D/sub 3/ state of Eu/sup 3+/ are particularly intense at 77 degrees K. Some lines originating in unidentified levels, higher than /sup 5/D/sub 3/ in energy, are also present. Thirty-nine of the 44 crystal components of /sup 5/D/sub 0-3/, /sup 7/F/sub 0-6/ are identified. Y/sub 2/O/sub 2/S:Eu/sup 3,/ is perhaps an optimal case of identification of degeneracies of the crystal components without benefit of the additional information afforded by polarization studies or by the Zeeman effect. From a consideration of all possible assignments of symmetry species for the crystal levels of /sup 7/F/sub 1-4/ in a systematic fashion, a small number of self- consistent sets of assignments and crystal-field parameters is obtained. Intensity data reduce the number of possibilities to four. For the most likely one of these, the deviation between observed and calculated crystal levels is 9 cm/sup -1/. The effect of J mixing is considerable. A fit to the barycenters of /sup 7/F/sub 0-4/ and /sup 5/D/sub 0-2/ yields values of the spin-orbit and electrostatic parameters zeta =1326 cm/sup -1/ and F/sub 2/=395.8 cm/sup -1/. A mechanism involving lattice vibrations is proposed which may explain the dramatic increase in intensities of transitions originating in /sup 5/D/sub 3/ when the temperature is lowered from 300 degrees to 77 degrees K.

Subfile: A

16/3,AB/1
DIALOG(R)File 2:INSPEC

02891168 INSPEC Abstract Number: A87070130
Title: Zinc sulphide thin films doped with rare earth ions
Author(s): Tammenmaa, M.; Leskela, M.; Koskinen, T.; Niinisto, L.
Author Affiliation: Dept. of Chem., Helsinki Univ. of Technol., Espoo, Finland
Journal: Journal of the Less-Common Metals vol.126 p.209-14
Publication Date: Dec. 1986 Country of Publication: Switzerland
CODEN: JCOMAH ISSN: 0022-5088
U.S. Copyright Clearance Center Code: 0022-5088/86/$3.50
Conference Title: Seventeenth Rare Earth Research Conference
Conference Date: 9-12 June 1986 Conference Location: Hamilton, Ont., Canada
Language: English
Abstract: Zinc sulphide thin films doped with trivalent rare earths (cerium, europium, terbium, thulium) have been grown by the atomic layer epitaxy (ALE) method using hydrogen sulphide and zinc chloride or acetate as starting materials and rare earth beta -diketonates as dopants. The films were characterized by X-ray diffraction and X-ray fluorescence techniques and their photoluminescence was studied. It is possible by ALE to grow thin films of good quality and to control the distribution of the rare earth ions in the ZnS matrix. The most intense luminescence was obtained with Ce/sup 3+/ and Tb/sup 3+/. Europium also gave a distinct luminescence while that of thulium remained poor. The band gap of ZnS was apparent in the excitation spectra and its energy depended on the crystal structure of the zinc sulphide thin film (cubic or hexagonal).
Subfile: A

32/3,AB/1
DIALOG(R)File 2:INSPEC

6507014 INSPEC Abstract Number: B2000-03-4260D-050
Title: Photon recycling semiconductor *light* emitting *diode*
Author(s): Xiaoyun Guo; Graff, J.; Schubert, E.F.
Author Affiliation: Dept. of Electr. & Comput. Eng., Boston Univ., MA, USA
Conference Title: International Electron Devices Meeting 1999. Technical Digest (Cat. No.99CH36318) p.600-3
Publisher: IEEE, Piscataway, NJ, USA
Publication Date: 1999 Country of Publication: USA 943 pp.
ISBN: 0 7803 5410 9 Material Identity Number: XX-2000-00353
U.S. Copyright Clearance Center Code: 0 7803 5410 9/99/$10.00
Conference Title: International Electron Devices Meeting 1999. Technical Digest
Conference Sponsor: Electron Devices Soc. IEEE
Conference Date: 5-8 Dec. 1999 Conference Location: Washington, DC, USA
Language: English
Abstract: A new white *light* emitting *diode*, the photon recycling semiconductor *light* emitting *diode* (PRS-LED) is demonstrated. The device consists of a GaInN/GaN LED emitting in the blue spectral range and an AlGaInP photon recycling semiconductor emitting at the complementary color. The PRS-LED thus has two emission lines, one in the blue and one in the amber wavelength range. The theoretical *luminous* efficiency of the PRS-LED exceeds 300 lm/W, higher than the efficiency of phosphor-based white LEDs.
Subfile: B

32/3,AB/2
DIALOG(R)File 2:INSPEC

6454211 INSPEC Abstract Number: A2000-03-4255P-048, B2000-02-4320J-064
Title: Integration of red, infrared, and blue *light* sources by wafer fusion
Author(s): Floyd, P.D.; Chua, C.L.; Treat, D.W.; Bour, D.P.
Author Affiliation: Electron. Mater. Lab., Xerox Palo Alto Res. Center, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3628 p.209-17
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1999 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1999)3628L.209:IIBL;1-R
Material Identity Number: C574-1999-124
U.S. Copyright Clearance Center Code: 0277-786X/99/$10.00
Conference Title: In-Plane Semiconductor Lasers III
Conference Sponsor: SPIE
Conference Date: 27-29 Jan. 1999 Conference Location: San Jose, CA, USA
Language: English
Abstract: In this work, we demonstrate fusion of GaAs-based *laser*

structures to GaN-based *light*-emitting *diode* (LED) heterostructures. Successful operation of red and infrared lasers fused to functioning GaN LEDs is achieved. A single heterostructure consisting of AlGaInAs-AlGaAs quantum well (QW) and GaInP-AlGaInP QW *laser* *diode* structures was grown by low-pressure organometallic vapor phase epitaxy (OMVPE) on GaAs substrates. The GaN LED structure was grown by OMVPE on an A-face sapphire substrate. The heterostructures were fused at 650 degrees C in an H/sub 2/ ambient, while under uniaxial pressure. To fabricate the lasers, the GaAs substrate was selectively etched, leaving the red and infrared QW *laser* stack structure on GaN. Ridge waveguide QW lasers and GaN LEDs were fabricated with the fused epilayers. Infrared, AlGaInAs QW lasers (4*500 mu m), operated with a threshold current (I/sub th/) of 40 mA and external differential quantum efficiency (eta /sub d/) of 11.5%/facet at about 821 nm. Red, GaInP QW lasers (4*500 mu m), operated with a I/sub th/ of 118 mA and eta /sub d/ of 18.7%/facet at about 660 nm. The adjacent InGaN-GaN LED emitted at 446 nm.

Subfile: A B

32/3,AB/3

DIALOG(R)File 2:INSPEC

6444110 INSPEC Abstract Number: A2000-03-4255P-016, B2000-02-4320J-020

Title: Heterogeneous integration of visible AlGaInP and infrared AlInGaAs lasers with GaN-based *light* sources

Author(s): Floyd, P.D.; Treat, D.W.; Bour, D.P.

Author Affiliation: Electron. Mater. Lab., Xerox Palo Alto Res. Center, CA, USA

Journal: Electronics Letters vol.35, no.24 p.2120-1

Publisher: IEE,

Publication Date: 25 Nov. 1999 Country of Publication: UK

CODEN: ELLEAK ISSN: 0013-5194

SICI: 0013-5194(19991125)35:24L.2120:HIVA;1-H

Material Identity Number: E089-1999-024

U.S. Copyright Clearance Center Code: 0013-5194/99/$10.00

Language: English

Abstract: Arrays of integrated red, infrared and blue *light* emitters fabricated using wafer fusion of GaAs-based *laser* structures to GaN-based *light*-emitting *diode* (LED) heterostructures are demonstrated. Successful operation of red and infrared lasers fused to functioning GaN LEDs has been achieved. Infrared, AlGaInAs QW lasers (4*500 mu m) operating with a threshold current (I/sub th/) of 40 mA and external differential quantum efficiency (n/sub d/) of 11.5%/facet at ~821 nm are shown. Red, GaInP QW lasers (4*500 mu m) operating with an I/sub th/ of 118 mA and eta /sub d/ of 18.7/facet at ~660 nm are also shown. The adjacent InGaN/GaN LED emits at 446 nm.

37/3,AB/1
DIALOG(R)File 2:INSPEC

6948355 INSPEC Abstract Number: B2001-07-4260D-028
Title: Optoelectronic characterization of blue InGaN/GaN LEDs grown by MBE
Author(s): Dalmasso, S.; Damilano, B.; Grandjean, N.; Massies, J.; Leroux, M.; Reverchon, J.-L.; Duboz, J.-Y.
Author Affiliation: Centre de Recherche sur l'Hetero-Epitaxie et ses Applications, CNRS, Valbonne, France
Journal: Materials Science & Engineering B (Solid-State Materials for Advanced Technology) Conference Title: Mater. Sci. Eng. B, Solid-State Mater. Adv. Technol. (Switzerland) vol.B82, no.1-3 p.256-8
Publisher: Elsevier,
Publication Date: 22 May 2001 Country of Publication: Switzerland
CODEN: MSBTEK ISSN: 0921-5107
SICI: 0921-5107(20010522)B82:1/3L.256:OCBI;1-K
Material Identity Number: M712-2001-007
U.S. Copyright Clearance Center Code: 0921-5107/2001/$20.00
Conference Title: European Materials Research Society (EMRS) 2000 Spring Meeting, Symposium C: Group III Nitrides
Conference Sponsor: Aixtron; Emcore
Conference Date: 30 May-2 June 2000 Conference Location: Strasbourg, France
Language: English
Abstract: *Light* emitting *diodes* were grown by molecular beam epitaxy using NH/sub 3/ as nitrogen precursor. The active layer is composed by a single plane of undoped InGaN layer with about 15% of In. The structure was buried by 2700 AA of Mg-*doped* GaN (p=1*10/sup 17/ cm/sup -3/). The turn on voltage is at 4.5 V and the operating voltage is 6.1 V at 20 mA. Temperature dependent I(V) characteristics reveal the predominance of tunneling injection current. We measure room temperature *electroluminescence* in the blue from 440 to 490 nm with a narrow full width at half maximum.
Subfile: B

37/3,AB/2
DIALOG(R)File 2:INSPEC

6733469 INSPEC Abstract Number: B2000-11-4260D-059
Title: Cubic InGaN/GaN double-heterostructure *light* emitting *diodes* grown on GaAs(001) substrates by MOVPE
Author(s): Taniyasu, Y.; Suzuki, K.; Lim, D.H.; Jia, A.W.; Shimotomai, M.; Kato, Y.; Kobayashi, M.; Yoshikawa, A.; Takahashi, K.
Author Affiliation: Dept. of Electron. & Mech. Eng., Chiba Univ., Japan
Journal: Physica Status Solidi A Conference Title: Phys. Status Solidi A (Germany) vol.180, no.1 p.241-6
Publisher: Wiley-VCH,
Publication Date: 16 July 2000 Country of Publication: Germany
CODEN: PSSABA ISSN: 0031-8965
SICI: 0031-8965(20000716)180:1L.241:CIDH;1-D
Material Identity Number: P159-2000-009
U.S. Copyright Clearance Center Code: 0031-8965/2000/$17.50+0.50
Conference Title: Third International Symposium on Blue Laser and Light Emitting Diodes (ISBLLED 2000)

Conference Date: 5-10 March 2000 Conference Location: Zeuthen, Germany
Language: English
Abstract: Cubic (zinc-blende) InGaN/GaN double-heterostructure LEDs were fabricated on GaAs (001) substrates. The device performance and crystal quality were investigated. The emission wavelength was controlled by the In content in the cubic InGaN active layer. The violet-blue *electroluminescence* was observed around 435 nm with a FWHM of 55 nm from a cubic In/sub 0.07/Ga/sub 0.93/N/GaN DH LED. The forward voltage was 4.9 V at 20 mA and the reverse leakage current was 5 mA at -10 V. X-ray reciprocal space mapping measurement was performed to investigate the phase purity and strain in InGaN/GaN heterostructure. The mixing of the stable hexagonal phase in the cubic GaN was observed and the hexagonal phase content was about 10%. In-situ spectroscopic ellipsometry measurement showed that most of the mixed hexagonal domains were likely to be formed in the Mg-*doped* GaN layer. In addition, the anisotropic lattice relaxation occurred in the InGaN active layer. The elimination of the hexagonal phase inclusions plays an important role for the realization of high performance devices.
Subfile: B

37/3,AB/3
DIALOG(R)File 2:INSPEC

6542126 INSPEC Abstract Number: A2000-09-8115H-015, B2000-05-0520F-016
Title: High-quality GaN on Si substrate using AlGaN/AlN intermediate layer
Author(s): Ishikawa, H.; Zhao, G.Y.; Nakada, N.; Egawa, T.; Soga, T.; Jimbo, T.; Umeno, M.
Author Affiliation: Res. Center for Micro-Structure Devices, Nagoya Inst. of Technol., Japan
Journal: Physica Status Solidi A Conference Title: Phys. Status Solidi A (Germany) vol.176, no.1 p.599-603
Publisher: Wiley-VCH,
Publication Date: 16 Nov. 1999 Country of Publication: Germany
CODEN: PSSABA ISSN: 0031-8965
SICI: 0031-8965(19991116)176:1L.599:HQSU;1-0
Material Identity Number: P159-2000-001
U.S. Copyright Clearance Center Code: 0031-8965/99/$17.50+0.50
Conference Title: 3rd International Conference on Nitride Semiconductors
Conference Date: 4-9 July 1999 Conference Location: Montpellier, France
Language: English
Abstract: A single crystal GaN thin film was successfully grown on a Si(111) substrate by means of atmospheric-pressure metalorganic chemical vapor deposition. An intermediate layer consisting of AlN and AlGaN improved the quality of GaN on Si with a mirror-like surface and reduced the pits and cracks over the surface. The full width at half maximum (FWHM) of the double-crystal X-ray rocking curve for GaN(0004) was 600 arcsec. Photoluminescence measurement at 4.2 K for a non-*doped* film revealed a sharp band-edge emission with a FWHM of 8.8 meV, which is the narrowest value reported to date. GaInN multi-quantum-well structure was grown on this structure and showed a strong blue emission peaking at 470 nm. The results suggest GaN on Si with an AlGaN/AlN intermediate layer provides reliable *light* emitting devices on Si substrate.
Subfile: A B

37/3,AB/4
DIALOG(R)File 2:INSPEC

6503959 INSPEC Abstract Number: A2000-06-8115H-043, B2000-03-0520F-049
Title: Properties of group III nitrides grown in production type MOVPE systems
Author(s): Protzmann, H.; Schoen, O.; Schwambern, M.; Schulte, B.; Henken, M.; Bremser, M.; Holst, J.; Hoffmann, A.; Yablonskii, G.P.
Author Affiliation: AIXTRON AG, Aachen, Germany
Conference Title: 1998 Conference on Optoelectronic and Microelectronic Materials and Devices. Proceedings (Cat. No.98EX140) p.112-15
Editor(s): Faraone, L.; Dell, J.M.; Fisher, T.A.; Musca, C.A.; Nener, B.D.
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Conference Title: Proceedings of Conference on Optoelectronic and Microelectronic Materials and Devices - COMMAD'98
Conference Sponsor: IEEE; IEEE Electron Devices Soc.; IEEE Lasers & Electro-Opt. Soc.; IEEE Australian Chapter of the Electron Devices Soc.; Lasers & Electro-Opt. Soc.; IEEE WA Sect. Australian Mater. Res. Soc.; Australian Inst. Phys
Conference Date: 14-16 Dec. 1998 Conference Location: Perth, WA, Australia
Language: English
Abstract: Due to an increased interest in the large scale production of GaN-based devices we have used our AIXTRON single wafer horizontal tube and Multiwafer Planetary(R) MOVPE systems for the fabrication of GaN/InGaN/GaN heterostructures, multiquantum well structures and LEDs. The AM 2000HT was set up in a configuration of 7*2 inch which provides unique uniformity capabilities due to the two fold rotation of the substrates. Thickness homogeneities and In composition have been shown to be around 1% on full 2 inch wafers. Wafer to wafer homogeneity of InGaN emitting at 440 nm at 300 K is also around 1%. Reproducibly we obtained resistivities of the GaN:Mg top layer of less than 1 Omega cm which corresponds to 5-10*10/sup 17/ cm/sup -3/. Simple GaN/InGaN LED test structures were fabricated to investigate the *doping* and the In incorporation mechanisms. Several DH, SQW and MQW LED test structures were grown and processed. Current-voltage characteristics, output power and the wavelength distribution were measured to evaluate the epitaxial growth. We fabricated LED test structures with peak wavelengths between 400-530 nm depending on layer structure and chosen In composition in the active layer. *Electroluminescence* (EL) of the QW and DH LED test structures resulted in intense violet and blue emission which was clearly visible under normal room *light*. LED test structures with 4 nm InGaN active region show a peak wavelength up to 460 nm with a FWHM of ~35 nm. Stimulated emission and optically pumped *laser* action was used to investigate the material quality for future *laser* applications. Room temperature gain spectra of MQW structures show a threshold value for the optical amplification of 200 KW/cm/sup 2/ and gain values up to 140 cm/sup -1/. The reported investigation of the optical properties and of the *laser* parameters under optical excitation clearly indicates the increased sample quality depending on growth parameters such as growth temperature, switching sequence, control of parasitic adduct formation or total pressure in the reactor.
Subfile: A B

37/3,AB/5
DIALOG(R)File 2:INSPEC

6150241 INSPEC Abstract Number: B1999-03-4260D-016
Title: Characteristics of a blue *light* emitting *diode* with In/sub x/Ga/sub 1-x/N MQW structure grown by MOCVD
Author(s): Lee, S.-H.; Bae, S.-B.; Tae, H.-S.; Lee, S.-H.; Hahm, S.-H.; Lee, Y.-H.; Lee, J.-H.
Author Affiliation: Kyungpook Nat. Univ., Taegu, South Korea
Journal: Journal of the Institute of Electronics Engineers of Korea D vol.35-D, no.8 p.24-30
Publisher: Inst. Electron. Eng. Korea,
Publication Date: Aug. 1998 Country of Publication: South Korea
CODEN: CKODF8 ISSN: 1226-5845
SICI: 1226-5845(199808)35D:8L.24:CBLE;1-Y
Material Identity Number: G412-1998-009
Language: Korean
Abstract: A blue LED with In/sub x/Ga/sub 1-x/N multiple quantum well structure, which had the blue emission spectrum of the donor-acceptor pair transition generated from a Si-Zn co-*doped* In/sub x/Ga/sub 1-x/N active layer, was fabricated. The In/sub x/Ga/sub 1-x/N MQW heterojunction LED structure was grown by MOCVD on a sapphire substrate with (0001) surface orientation at 800 degrees C. The fabricated LED exhibited forward cut-in voltage of 4-4.5 V and reverse breakdown voltage of -13 V. Its optical characteristics showed that the peak emission center wavelength occurred at 460 nm and the optical intensity was increased linearly with respect to the injected electrical current above 5 mA.
Subfile: B

37/3,AB/6
DIALOG(R)File 2:INSPEC

6150240 INSPEC Abstract Number: B1999-03-4260-002
Title: Growth and characterization of In/sub x/Ga/sub 1-x/N epitaxial layer for blue *light* emitter
Author(s): Lee, S.-H.; Lee, J.-S.; Huh, J.-S.; Lee, H.-G.; Lee, S.-H.; Hahm, S.-H.; Lee, Y.-H.; Lee, J.-H.
Author Affiliation: Kyungpook Nat. Univ., Taegu, South Korea
Journal: Journal of the Institute of Electronics Engineers of Korea D vol.35-D, no.8 p.15-23
Publisher: Inst. Electron. Eng. Korea,
Publication Date: Aug. 1998 Country of Publication: South Korea
CODEN: CKODF8 ISSN: 1226-5845
SICI: 1226-5845(199808)35D:8L.15:GCIE;1-S
Material Identity Number: G412-1998-009
Language: Korean
Abstract: A single crystalline In/sub x/Ga/sub 1-x/N thin film was grown by MOCVD on a (0001) sapphire substrate for blue *light* emitting devices. Good In/sub 0.13/Ga/sub 0.87/N-GaN heterostructure quality grown above 700 degrees C was confirmed by various characterization techniques, such as AFM, RHEED and DC-XRD. Through PL measurements at room temperature for the Si-Zn co-*doped* In/sub x/Ga/sub 1-x/N-GaN structure grown at 800 degrees C to obtain blue wavelength emission, 460-470 nm and 425 nm emission peaks

were observed, which are believed to be from donor-to-acceptor pair transitions and band edge emission of In/sub x/Ga/sub 1-x/N, respectively. The result of PL measurements of the undoped MQW In/sub x/Ga/sub 1-x/N layer at low temperature confirmed that the strong MQW peak resulted from an exciton from the GaN barrier and the carrier of the DA pair being confined in the well layer.
Subfile: B

37/3,AB/7
DIALOG(R)File 2:INSPEC

6089701 INSPEC Abstract Number: A9901-0762-012, B9901-7230C-016
Title: Using a *light*-emitting *diode* as a high-speed, wavelength selective photodetector
Author(s): Miyazaki, E.; Itami, S.; Araki, T.
Author Affiliation: Fac. of Educ., Kagawa Univ., Takamatsu, Japan
Journal: Review of Scientific Instruments vol.69, no.11 p.3751-4
Publisher: AIP,
Publication Date: Nov. 1998 Country of Publication: USA
CODEN: RSINAK ISSN: 0034-6748
SICI: 0034-6748(199811)69:11L.3751:ULED;1-C
Material Identity Number: R017-98011
U.S. Copyright Clearance Center Code: 0034-6748/98/69(11)/3751(4)/$15.00
Language: English
Abstract: A *light*-emitting *diode* (LED) can function as a wavelength selective photodetector. To evaluate the potential for a LED-based photodetector, we have investigated the stationary and temporal characteristics of two kinds of LEDs: a Zn-*doped* InGaN blue LED and a GaAlAs red LED. The application of a high current produced two peaks on the emission spectra of the blue LED, at 380 and 450 nm. The extinction profile of the blue LED was consistent with its UV-emission profile. The red LED showed an emission peak at 660 nm and an extinction peak at 620 nm. The LED-based photodetector responded within nanoseconds of the onset of the *light* impulse. The application of a reverse bias to the LED caused the time spread of the output current wave form to decrease dramatically and was accompanied by an increase in peak height. At a 75 V reverse bias, the resultant pulse widths were 2.6 ns in the blue LED and 7.4 ns in red LED.
Subfile: A B

37/3,AB/8
DIALOG(R)File 2:INSPEC

5993489 INSPEC Abstract Number: A9818-4260B-013, B9809-4320J-107
Title: Cleaved and etched facet nitride *laser* *diodes*
Author(s): Abare, A.C.; Mack, M.P.; Hansen, M.; Sink, R.K.; Kozodoy, P.; Keller, S.; Speck, J.S.; Bowers, J.E.; Mishra, U.K.; Coldren, L.A.; DenBaars, S.P.
Author Affiliation: Dept. of Electr. & Comput. Eng., California Univ., Santa Barbara, CA, USA
Journal: IEEE Journal of Selected Topics in Quantum Electronics vol.4, no.3 p.505-9
Publisher: IEEE,
Publication Date: May-June 1998 Country of Publication: USA

CODEN: IJSQEN ISSN: 1077-260X
SICI: 1077-260X(199805/06)4:3L.505:CEFN;1-E
Material Identity Number: C465-98006
U.S. Copyright Clearance Center Code: 1077-260X/98/$10.00
Language: English
Abstract: Room-temperature (RT) pulsed operation of blue (420 nm) nitride-based multiquantum-well *laser* *diodes* grown on a-plane and c-plane sapphire substrates has been demonstrated. Structures investigated include etched and cleaved facets as well as *doped* and undoped quantum wells. A combination of atmospheric and low-pressure metal organic chemical vapor deposition using a modified two-flow horizontal reactor was employed. Threshold current densities as low as 12.6 kA/cm/sup 2/ were observed for 10*1200 mu m lasers with uncoated reactive ion etched facets on c-plane sapphire. Cleaved facet lasers were also demonstrated with similar performance on a-plane sapphire. *Laser* *diodes* tested under pulsed conditions operated up to 6 h at RT. Lasing was achieved up to 95 degrees C and up to a 150-ns pulselength (RT). Threshold current increased with temperature with a characteristic temperature T/sub 0/ of 114 K.
Subfile: A B

37/3,AB/9
DIALOG(R)File 2:INSPEC

5805271 INSPEC Abstract Number: A9804-7865-075, B9802-4260D-029
Title: Blue and green *electroluminescence* from GaN/InGaN heterostructures
Author(s): Averbeck, R.; Tews, H.; Graber, A.; Riechert, H.
Author Affiliation: Zentralabteilung Forschung & Entwicklung, Siemens AG, Munchen, Germany
Journal: Journal of Crystal Growth Conference Title: J. Cryst. Growth (Netherlands) vol.175-176, pt.1 p.122-4
Publisher: Elsevier,
Publication Date: May 1997 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
SICI: 0022-0248(199705)175/176:1L.122:BGEF;1-O
Material Identity Number: J037-97017
U.S. Copyright Clearance Center Code: 0022-0248/97/$17.00
Conference Title: Proceedings of the Ninth International Conference on Molecular Beam Epitaxy
Conference Sponsor: AFOSR; ARO; ONR; NSF; DARPA
Conference Date: 5-9 Aug. 1996 Conference Location: Malibu, CA, USA
Language: English
Abstract: GaN/InGaN pn-junctions were grown by molecular beam epitaxy. Depending on the In content bright blue (470 nm) or green (513 nm) *electroluminescence* was observed at room temperature.
Subfile: A B

37/3,AB/10
DIALOG(R)File 2:INSPEC

5804296 INSPEC Abstract Number: A9804-6865-025, B9802-0510D-128
Title: The growth of InGaN/(Al)GaN quantum well structures in a multi-wafer high speed rotating disk reactor

Author(s): Thompson, A.G.; Schurman, M.; Feng, Z.C.; Karlicek, R.F.; Salagaj, T.; Tran, C.A.; Stall, R.A.
Author Affiliation: EMCORE Corp., Somerset, NJ, USA
URL: http://nsr.mij.mrs.org/1/24/
Journal: MRS Internet Journal of Nitride Semiconductor Research vol.1
Publication URL: http://nsr.mij.mrs.org/
Publisher: Mater. Res. Soc,
Publication Date: 1996 Country of Publication: USA
CODEN: MIJNF7 ISSN: 1092-5783
Material Identity Number: G359-97001
Language: English
Abstract: In the past year, several organizations have fabricated reliable, high-brightness LEDs from III-nitride materials that emit in the blue and green. Recently, Nichia in Japan have announced lasing action in GaN-based *diodes* . Quantum well structures are key to all these results, offering higher brightness, narrower EL linewidths, and a wider spectral range. In order for the III-nitride technology to develop, the material growth technique must offer high volume at low cost in addition to the requisite device performance. To date, only MOVPE has demonstrated this capability. We have previously reported the growth of GaN, InGaN, and AlGaN layers by MOVPE in a multi-wafer, high-speed rotating disk reactor. Both n- and p-*doping* and high quality optical properties have been achieved. In this paper we extend this earlier work and present results of the performance of InGaN/(Al)GaN quantum well structures. Intense PL spectra were observed in the violet and blue regions. The thinnest wells show evidence from PL and DCXRD measurements of either discontinuous layers (islands) or a diffuse upper interface, with preliminary TEM results showing the latter to be the most likely. We also report excellent uniformity of these quantum well structures, and show *electroluminescence* from a SQW *diode* emitting at 473 nm.
Subfile: A B

37/3,AB/11
DIALOG(R)File 2:INSPEC

5065583 INSPEC Abstract Number: B9511-4260D-013
Title: InGaN/AlGaN double-heterostructure blue LEDs
Author(s): Nakamura, S.
Author Affiliation: Dept. of Res. & Dev., Nichia Chem. Ind. Ltd., Tokushima, Japan
Conference Title: Diamond, SiC and Nitride Wide Bandgap Semiconductors. Symposium p.173-8
Editor(s): Carter, C.H., Jr.; Gildenblat, G.; Nakamura, S.; Nemanich, R.J.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1994 Country of Publication: USA xv+760 pp.
Conference Title: Diamond, SiC and Nitride Wide Bandgap Semiconductors. Symposium
Conference Date: April-Aug. 1994 Conference Location: San Francisco, CA, USA
Language: English
Abstract: High-brightness InGaN/AlGaN double-heterostructure (DH) blue-*light*-emitting *diodes* (LEDs) with a *luminous* intensity of 1.2 cd were fabricated successfully for the first time. As an active layer, a Zn-*doped* InGaN layer was used. The peak wavelength and the full width at half-maximum of the *electroluminescence* were 450 nm and 70 nm,

respectively. The forward voltage was as low as 3.6 V at 20 mA.
Subfile: B

37/3,AB/12
DIALOG(R)File 2:INSPEC

5012503 INSPEC Abstract Number: B9509-4260D-021
Title: InGaN/AlGaN blue-*light*-emitting *diodes*
Author(s): Nakamura, S.
Author Affiliation: Dept. of Res. & Dev., Nichia Chem. Ind. Ltd., Tokushima, Japan
Journal: Journal of Vacuum Science & Technology A (Vacuum, Surfaces, and Films) Conference Title: J. Vac. Sci. Technol. A, Vac. Surf. Films (USA) vol.13, no.3, pt.1 p.705-10
Publication Date: May-June 1995 Country of Publication: USA
CODEN: JVTAD6 ISSN: 0734-2101
U.S. Copyright Clearance Center Code: 0734-2101/95/13(3)/705/6/$6.00
Conference Title: 41st National Symposium of the American Vacuum Society
Conference Date: 24-29 Oct. 1994 Conference Location: Denver, CO, USA
Language: English
Abstract: Highly efficient InGaN/AlGaN double-heterostructure blue-*light*-emitting *diodes* (LEDs) with an external quantum efficiency of 5.4% were fabricated by codoping Zn and Si into an InGaN active layer. The output power was as high as 3 mW at a forward current of 20 mA. The peak wavelength and the full width at half maximum of the *electroluminescence* of blue LEDs were 450 and 70 nm, respectively. Blue-green LEDs with a brightness of 2 cd and a peak wavelength of 500 nm were fabricated for application to traffic lights by increasing the indium mole fraction of the InGaN active layer.
Subfile: B

37/3,AB/13
DIALOG(R)File 2:INSPEC

4893992 INSPEC Abstract Number: B9504-4260D-015
Title: Zn-*doped* InGaN growth and InGaN/AlGaN double-heterostructure blue-*light*-emitting *diodes*
Author(s): Nakamura, S.
Author Affiliation: Dept. of Res. & Dev., Nichia Chem. Ind. Ltd., Tokushima, Japan
Journal: Journal of Crystal Growth vol.145, no.1-4 p.911-17
Publication Date: Dec. 1994 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
U.S. Copyright Clearance Center Code: 0022-0248/94/$07.00
Conference Title: Seventh International Conference on Metalorganic Vapor Phase Epitaxy
Conference Date: 31 May-3 June 1994 Conference Location: Yokohama, Japan
Language: English
Abstract: High-power InGaN/AlGaN double-heterostructure (DH) blue-*light*-emitting *diodes* (LEDs) with the output power of 1.5 mW at a forward current of 20 mA were fabricated successfully for the first time. This value of output power was the highest ever reported for blue LEDs. As an

active layer, a Zn-*doped* InGaN layer was used for these DH LEDs. The peak wavelength and the full width at half-maximum of the *electroluminescence* were 450 nm and 70 nm, respectively. The forward voltage was as low as 3.6 V at 20 mA.
Subfile: B

37/3,AB/14
DIALOG(R)File 2:INSPEC

4658919 INSPEC Abstract Number: B9406-4260D-006
Title: Candela-class high-brightness InGaN/AlGaN double-heterostructure blue-*light*-emitting *diodes*
Author(s): Nakamura, S.; Mukai, T.; Senoh, M.
Author Affiliation: Dept. of Res. & Dev., Nichia Chem. Ind. Ltd., Tokushima, Japan
Journal: Applied Physics Letters vol.64, no.13 p.1687-9
Publication Date: 28 March 1994 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
U.S. Copyright Clearance Center Code: 0003-6951/94/64(13)/1687/3/$6.00
Language: English
Abstract: Candela-class high-brightness InGaN/AlGaN double-heterostructure (DH) blue-*light*-emitting *diodes* (LEDs) with the *luminous* intensity over 1 cd were fabricated. As an active layer, a Zn-*doped* InGaN layer was used for the DH LEDs. The typical output power was 1500 mu W and the external quantum efficiency was as high as 2.7% at a forward current of 20 mA at room temperature. The peak wavelength and the full width at half-maximum of the *electroluminescence* were 450 and 70 nm, respectively. This value of *luminous* intensity was the highest ever reported for blue LEDs.